PPG wave 3.V

User Manual

English

waldorf

Foreword

Thank you for purchasing the Waldorf PPG Wave 3.V.

You now own a synthesizer which combines the unique Wavetable synthesis sound of the legendary PPG Wave 2.2 and 2.3 synthesizers from the 1980s with the advantages of a modern software Plug-In. The PPG Wave 3.V is featuring a wide range of unique sounds of high quality including emulated Waveterm sample playback.

What to read?

The biggest problem with any manual is to cover both the needs of an absolute expert and a beginner alike. There are people who read a manual cover to cover while others don't even touch it. The latter is the worst choice, especially when the manual describes a Waldorf instrument.

If you decide to read the following manual, we promise you a lot of fun while reading about and working with the Waldorf PPG Wave 3.V.

Your Waldorf Team

Hint

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Please visit our website www.waldorfmusic.de for more information about our products.

We would like to thank

Christian Bacaj, Karsten Dubsch, Willie Eckl, Joachim Flor, Michael von Garnier, Frank Schneider, Kurt “Lu” Wangard, 吴海彬 and anyone we have forgotten.

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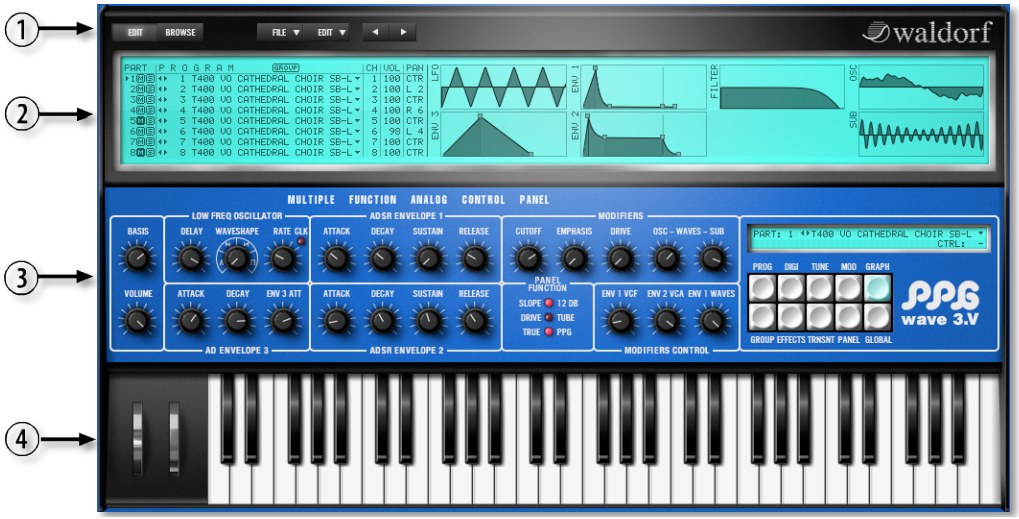
Overview

User Interface



① Top Menu section

② Digital Control Panel section

③ Analog Control Panel section with Panel buttons and display

④ Virtual Keyboard

Introduction

About this Manual

This manual was written to help you to become familiar with the PPG Wave 3.V synthesizer. It will also aid experienced users with routine tasks.
To avoid confusion, the terminology in this manual is based on the PPG Wave 3.V parameter names. You will find the various terms explained in a glossary at the end of this manual.

We also used a uniform set of symbols to show you topics of particular interest or significance. Important terms are highlighted in bold letters.

Symbols

⚠ **Caution – The comments that follow this symbol will help you avoid errors and malfunctions.**

Info – Additional information on a given topic.

✻ **Example –** Real-world examples to try out.

Highlighted Control Features and Parameters

All of the PPG Wave 3.V´s buttons, controls and parameters are highlighted in **bold** letters throughout the manual.

Example:

- Turn the **Cutoff** dial.

The PPG Wave 3.V's different modes and parameter pages are illustrated in a depiction of the display.

The value range of a continuous parameter is indicated from low to high with both values shown in italic letters, separated by three dots.

Example:

Cutoff *0…63*

Installation

System Requirements for Windows

In order to be able to use the PPG Wave 3.V, you will need at least:

- A PC with a Pentium IV or AMD Athlon 1 GHz processor or better, we recommend a fast CPU.
- 64 MB free RAM.
- Windows XP or newer.
- VST 2.4 compatible host application such as Steinberg Cubase or newer. This must be correctly installed on your computer.
- AAX compatibel host application such as Pro Tools 10. This must be correctly installed on your computer.

Please also observe the system requirements of your host application!

PPG Wave 3.V runs within 32 bit as well as 64 bit host applications.

Installation under Windows

Proceed as follows to install the PPG Wave 3.V:

Installation from CD-ROM:

1. Start your computer and launch your operating system. Insert the PPG Wave 3.V CD-ROM into your DVD/CD-ROM drive. If you have enabled the Autostart function in Windows, the Installer will start automatically and you can proceed with Step 5 below. If not, please proceed as follows:

2. Launch the Explorer or open the window “My Computer”.

3. Double click on the icon for the drive that holds the PPG Wave 3.V-CD-ROM.

4. Double click on the PPG Wave 3.V Installer icon. This launches a special installation program.

5. Follow the on-screen instructions.

After installing PPG Wave 3.V you will have to activate the program on your computer Please refer to the chapter “Activation of PPG Wave 3.V”.

Installation of a Downloaded Installer File:

1. Refer to the folder where the downloaded PPG Wave 3.V zip archive is located.

2. Double click on the archive file to extraxt it.

3. Double click on the PPG Wave 3.V Installer icon. This launches a special installation program.

4. Follow the on-screen instructions.

After installing PPG Wave 3.V you will have to activate the program on your computer. Please refer to the chapter “Activation of PPG Wave 3.V”.

System Requirements for Mac OS X

In order to be able to use the PPG Wave 3.V, you will need at least:

- Mac with 1.5 GHz Intel processor or better.
- Mac OS X 10.6 or newer.
- 128 MB of free RAM.
- VST 2.4 compatible host application or a VST3 compatible host application such as Steinberg Cubase. This must be correctly installed on your computer.

or

- An AudioUnit 2.0 compatible host application such as Apple Logic or GarageBand. This must be correctly installed on your computer.

or

- An AAX compatible host application such as Pro Tools 10. This must be correctly installed on your computer.

Please also observe the system requirements of your host application!

PPG Wave 3.V runs within 32 bit as well as 64 bit host applications.

Installation under Mac OS X

Proceed as follows to install the PPG Wave 3.V:

Installation from CD-ROM:

1. Quit all other applications so that you return to the Finder. Disable any system activity monitoring software or extension. Then insert the PPG Wave 3.V CD into your computer's DVD/CD-ROM drive.

2. If required, double click on the PPG Wave 3.V icon to open the CD window.

3. Double click on the PPG Wave 3.V Installer icon to load the installation software. Follow the instructions on the screen.

After installing PPG Wave 3.V you will have to activate the program on your computer Please refer to the chapter "Activation of PPG Wave 3.V".

Installation of a Downloaded Installer File:

1. Refer to the folder where the downloaded PPG Wave 3.V zip archive is located.

2. Double click on the archive file to extraxt it.

3. Double click on the PPG Wave 3.V Installer DMG icon. This launches a special installation program.

4. Follow the on-screen instructions.

After installing PPG Wave 3.V you will have to activate the program on your computer Please refer to the chapter "Activation of PPG Wave 3.V".

Activation of PPG Wave 3.V

PPG Wave 3.V uses a software based copy protection called eLicenser. PPG Wave 3.V can only run with an activated license.

⚠ **Really important — The license code can be used just once and becomes invalid after first use. If you have lost your license code by a hard disk crash or renewing your operating system please contact our support: support@waldorfmusic.de**

Independent of installing the PPG Wave 3.V on a Mac or Windows computer you will need to activate the software. You need to have administrator rights to install and authorize PPG Wave 3.V. If your current user account doesn't have administrator rights, please quit the installer, log in as user with administrator rights and start the installer again.

ℹ You require an active internet connection for license activation.

1. After successful installation of the PPG Wave 3.V plug-in the eLicenser Control Center application will start automatically. If not, please start it manually. eLicenser Control Center can be found within your Application folder.

2. In the application windows please choose the option “Enter Activation Code”.

3. Enter the activation code that was included in your PPG Wave 3.V package. Confirm it and follow the instructions.

4. You can download your final activation as software license (SeL) or directly to a connected optional eLicenser USB Key (e.g. Steinberg Key).

ℹ PPG Wave 3.V is copy-protected by the Soft eLicenser Copy Protection. You do not need an USB key to authorize PPG Wave 3.V on a particular computer. However, we strongly recommend to transfer the PPG Wave 3.V license to an eLicenser USB Key (i.e. from Steinberg or eLicenser) during or after activation. Please consult the eLicenser Control Center Online Help how to perform this optional step.

If you want to use PPG Wave 3.V on different computers or if you want to remove the soft license from your current computer or if you need to reinstall your computer system you must transfer the PPG Wave 3.V eLicense to an eLicenser USB Key. Otherwise your soft license will be gone forever.

Please note the “Read Me!” and “Important Changes” text files on the PPG Wave 3.V CD-ROM, which may contain additional information and/or any changes.

If you want to upgrade your operating system software or exchange any hardware system component make sure to transfer your soft eLicense to an optional eLicenser USB Key before. Otherweise your soft license will be gone forever.

Basic Operation

General Operation

PPG Wave 3.V has been optimized for a screen resolution of at least 1024x768 pixels. If the resolution of your screen is lower you will have to scroll your window. PPG Wave 3.V has various on-screen controls, whose behavior differs according to the **Control Mode** settings in the **Global** panel (Auto/Linear/Circular).

Useful Knowledge about Multi Parts

With the PPG Wave 3.V, you can simultaneously create up to eight different sounds. This function is generally called Multi Part Mode. Which of the eight sounds you play, depends on the MIDI send channel of your host application. You can use the Program menu to select sounds for the eight MIDI channels.

There are three reasons to use the Multi Part Mode:

- Working with a sequencer. You want to use different sound programs on different MIDI channels for simultaneous playback.
- Layering of sound programs. You want to create new, astonishing sound combinations.
- Working with multi samples (Transients)

Using the Transients (samples) in connection with the multimode is a distinctive feature. Please read the corresponding chapter “Transient Menu”.

Make sure to load the PPG Wave 3.V as multitimbral instrument within your host application to provide full functionality when using the Multi Part Mode.

Key Combinations

- If you hold down the [CTRL] key (PC) or Command key (Mac) on your computer keyboard and click on any control, its value is automatically set to its default value (e.g. Cutoff is set to *63*, Emphasis is set to *0* or modulations are set to *OFF*).
- If you hold down the [SHIFT] key when in linear mode, you can increase the resolution of a dial, value selector or wheel.
- If you use a computer mouse with scroll wheel you can use it to change parameters. Move your mouse pointer

over the desired value and use the scroll wheel to change it. If you hold down the [SHIFT] key you can also increase the resolution.

- You can increase the resolution of a dial, value selector or wheel by holding down the [Shift] key on your computer keyboard when you use the respective control. If a dial is set to “circle mode” (you change a value by dragging around the dial in a circle), then you can temporarily change to “up/down mode” by holding down [ALT].
- Doubleclick on a value to open a text input field for direct parameter input via your computer keyboard.

Control Elements

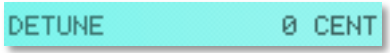
The PPG Wave 3.V user interface panel corresponds to that of the original PPG Wave 2.3. But why are not all parameters displayed in the form of faders, although this would easily be possible within such a digital environment? As matter of fact the character of a synth is not only rooted in its sound but also in its access methods. That is why the analog user interface panel of the PPG Wave 3.V displays all parameters as dials, same as it was the case with the original. All digital parameters can be viewed and edited on a 'LCD' display.

Using PPG Wave 3.V’s controls is simple. There are some different types of control elements:

Dials

To set a value, click on the dial, hold down the mouse button and drag around the dial in a circle (**Control Mode** setting: Circular) or move the mouse up and down (**Control Mode** setting: Linear). The **Control Mode** setting can be found within the **Global** panel.

Parameter Values



These allow to set a parameter value. Click and hold the mouse button on the value and drag the mouse up or down. Pressing [SHIFT] while holding the mouse button allows finer adjustment. You can also doubleclick on any value to enter it via your computer keyboard.

Pop-up Menu

Click on the corresponding parameter to open a pop-up menu where you can choose the desired parameter.

Switches

Switches are represented by "LEDs". If a function is active, its "LED" will be lit red. To activate/deactivate a function, click on its "LED".

Buttons

A mouse click on a button activates a function. The DIGI button can for instance be used to open the DIGITAL menu. Except for the PANEL button, buttons light up in blue when they have been used. Button states are not saved with programs.

Selection Switches

These allow you to set a parameter value to ON or OFF. Click on the value to switch between ON and OFF.

Display

The information display shows parameter information and a brief description of the parameter function. In addition, MIDI controller allocations (CTRL) and the current numerical value of the parameter are displayed as well as the actual multi part. If you hover over a parameter using the mouse, the corresponding information appears in the information display. Clicking on the arrow buttons leftside of the sound program name allows you to switch forth and back between programs. Clicking on the arrow rightside opens a pop-up menu for fast program selection within the actual bank.

Envelopes and Graphs

Click on the respective handle of an envelope and drag into the desired direction to change the desired envelope parameter. You can also doubleclick on any selected value to open a text field for direct value input.

Click and move your mouse vertically within the LFO and oscillator graphs to change the desired parameter.

Wheels

To change the value, click on the wheel and drag the mouse up or down. The Pitch-Bend wheel snaps back into its center position as soon as you release the mouse button.

Waldorf Logo

If you click on the Waldorf logo, a "program information" window opens.

The Virtual Keyboard

Same as the original, the PPG Wave 3.V provides a standard keyboard (61 keys). Click on a key to hear the corresponding note. If you hold the [ALT] key while clicking, you can hold a note to play chords. Release the [ALT] key to end the played notes.

Sound Selection

To select a Sound Program, please proceed as follows:

- Click on the arrow buttons in the Head-up section to step through the sound programs of the current loaded sound bank.
- Click on the left arrow buttons in the Display to step through the sound programs of the current loaded sound bank.
- Click on the right arrow button in the Display to open a pop-down menu for a faster sound selection.
- Use the Program overview to select sound programs for all 8 parts.
- Use our Sound Browser for efficient and fast sound selection and search. Read more in the corresponding chapter.
- If your host application offers a Load/Save dialogue you can also use it to load and save sound programs.

The Controls

Overview of Functions

The analog user interface offers direct access to the dials on the PPG Wave 3.V. The pitch-bend and modulation wheel can be controlled both from within the Plug-In and from your master keyboard. Same as on the original PPG Wave 2.3, the setting of the modulation wheel is stored separately for each sound program. This lets you save a sound with preset modulations.

The Top Menu Section

The Top Menu section provides the global overview and includes the following elements:

1. The **BROWSE** and **EDIT** buttons toggle between standard PPG Wave 3.V user interface (EDIT) and Sound Browser window (BROWSE).

2. The **File** menu button opens a pop-down menu containing all functions for loading and saving programs and banks.

3. The **Edit** menu button opens a pop-down menu containing various functions for editing sound programs, banks and parts.

4. The Sound Selection arrow buttons are for selecting sound programs.

5. The Waldorf logo is clickable and opens a window with vitally important information about the PPG Wave 3.V.

The File Menu

Left click on the File menu button to open a pop-down menu with the following parameters:

- **Load Bank** opens a window to load a PPG Wave 3.V sound bank.
- **Save Bank** opens a window to save the current PPG Wave 3.V sound bank.
- **Load Program** opens a window to load a single PPG Wave 3.V sound program.
- **Save Program** opens a window to save the current PPG Wave 3.V sound program.

- **Save All Programs up to this Program** saves all sounds from sound program 1 to the current sound program as single sounds.
- **Save All Programs up to this Program as Audio Unit Preset (only Mac)** saves all sounds from sound program 1 to the current sound program as single AudioUnit presets.

The Edit Menu

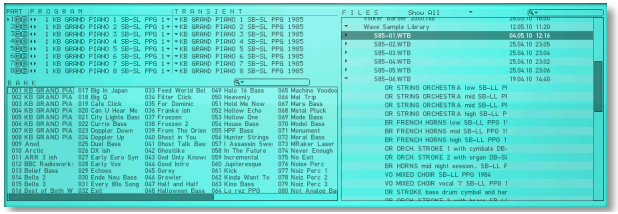
Left click on the Edit menu button to open a pop-down menu with the following parameters:

- **Copy Program** copies the current sound program into the clipboard.
- **Paste Program** pastes the sound program from the clipboard to the current sound program.
- **Recall Program** recalls all sound edits and recalls the program as it was stored.
- **Init Program** initializes the current sound and sets all sound parameters to standard values.
- **Init Part** initializes the current part and sets all part parameters to standard values.
- **Init All Parts** initializes all parts and sets all part parameters to standard values.
- **Recall Bank** recalls all sound edits of the loaded bank and recalss the bank as it was stored.
- **Init Bank** initializes the current bank and sets all parameters to standard values.

Please note that some host applications like Cubase 4 or 5 use an additional sound data managment. It offers an alternative way to load and save sounds. Please refer to the corresponding chapter in the manual of your host application.

The Sound Browser

The PPG Wave 3.V offers comprehensive functionality for selecting, searching and managing sound programs.



Click on the **BROWSE** button in the Top Menu section to open the Sound Browser window.

The Sound Browser consists of three main sections: The **Part Manager** in the top left area, the **Bank Manager** in the lower left area and finally the **File Browser** on the right.

At the top of the File Browser different search and category options are available:

- The pop-up menu “Show all” selects which file types are displayed. You can choose between “Show all”, show “Programs” only, show “Banks” only, show “Waveterm B Disk Images” or show “AudioUnit Setting” (Mac only).
- File Browser search field – here you can type in any name or search strings to find desired sounds, banks etc. Search results will be shown in the File Browser window. Click on the cross to reset the search field.
- Bank Manager table search field – here you can type in any name or search strings to find desired sounds of a bank. Search results will be highlighted, all other sounds greyed out. Click on the cross to reset the search field.

Part Manager

Here you can manage all used Multi parts as also the corresponding samples (Transients).

Keep in mind that the Part Manager is available in all program modes. Selection of Transients (Samples) is only possible within the Part Manager or in the PROGRAM panel.

You can mute (M) or solo (S) each of the 8 parts by using the corresponding buttons.

You can select sound programs by using the arrow buttons.

To select the desired MIDI receive channel you can open a drop-down menu by clicking on the arrow button next to the MIDI channel number.

To play the sound program of a Part you have to set the corresponding MIDI channel within your host application to the same channel number.

The column *Transient* allows to load a separate sample for each Part. Click on the corresponding arrow button to open a context menu and choose "*Load Transient...*". "*Clear*" removes a loaded Transient. Drag & Drop of samples is also supported.

Alternatively you can play multi samples with separate key zones by using the 8 parts. Please read more in the chapter "Transient Menu".

Bank Manager

The Bank Manager shows all 128 Programs of the currently loaded Bank. It allows to quickly access or manage these sounds. Managing includes reordering, copying and pasting, importing and exporting among other functions. It offers the following mouse and keyboard functions:

- Click selects a Program. Selected Programs are highlighted with a filled background in a different colour.
- 2nd Click gives you the ability to rename a Program.
- Double-Click switches to that Program. Active Programs are highlighted with a frame in a different colour.
- Shift + Click selects a contiguous range of Programs.
- Command + Click [Mac] / CTRL + Click [Windows] adds a Program to or removes it from the current selection.
- Right Click [also CTRL + Click on Mac] opens a context menu with the following menu items:
  - **Open** – opens a fxp or aupreset from a desired location.
  - **Save as Single Programs** – saves the selected Programs to a desired location as fxp (VST version) or aupreset (AU version).

- **Copy** – copies the selected Programs to the system clipboard. This allows copying and pasting Programs between different PPG Wave 3.V instances.
- **Paste** – pastes the copied Programs into the currently selected Programs. If there are less Programs selected, the remaining Programs are pasted into the following Programs.
- **Init** – initializes the selected Programs.
- **Select All** – selects all Programs in the Program Table.
- **Sort By Name/Category Ascending/Descending** – sorts the selected Programs according to the chosen function. Note that Category Sort doesn't sort the factory-given categories alphabetically but in a meaningful order.

- Arrow Keys (Up / Down / Left / Right) select a Program and switch to it.
- Shift + Arrow Keys selects a contiguous range of Programs.

Dragging:

- **Swap** – Drag and drop entries inside the Program Table swaps the selected Programs with the ones starting at the drop location.
- **Copy** – Holding Option [Mac] or Alt [Windows] during the drop operation copies the selected Programs to the ones starting at the drop location.
- **Import** – Drop of a selection of files of known file types from Finder [Mac] or Explorer [Windows] imports them into Programs starting at the drop location. Dropping Bank Files (.fxb) and Program Files (.fxp or .aupreset [Mac]) at once results in undefined behaviour, depending on the order in which the Operating System delivers these files to PPG Wave 3.V.
- **Export** – Drag and Drop into the File Browser, the Finder [Mac], the Explorer [Windows] or any other application that is aware of dragged files saves the selected Programs to disk into the selected folder as invidivual .fxp files (or as .auprest files when run as AudioUnit on Mac). The files are always stored with unique file names, so no existing files are overwritten.

- **Share** – Drop on any application that can handle files to perform further actions with them, such as an email application to easily share PPG Wave 3.V Programs with other musicians.
- **List** – Drop on any application window that doesn't handle files creates a text list from the selected programs, such as a plain text editor (no rich text editor since that one understands drag & drop of files), e.g. TextEdit [Mac] or Notepad [Windows].

File Browser

The File Browser shows file and folder (directory) hierarchies of certain folders in a tree view similar to the Finder [Mac] or Explorer [Windows]. It allows to quickly access or manage files of all known file types on disk. Managing includes restructuring, duplicating, removing, importing and exporting among other functions. Only known file types are presented, files that PPG Wave 3.V doesn't understand are not added to the tree.

The following file types will be displayed:

- VST presets and banks (.fxp and .fxb)
- AU presets (.aupreset, only Mac)
- Waveterm B Library Transients
- Audio formats AIFF, Wave, mp3, Ogg Vorbis, FLAC

The File Browser view differs from the Explorer tree view [Windows] in that it displays folders and files both in the same structure. This allows to view or select files in different folders at once which wouldn't be possible with a split view, which would only show the files of one single folder.

The File Browser shows at least the content of the default PPG Wave 3.V Program locations on disk. They are called Local Library (accessible for all users of the particular computer) and User Library (accessible only for the current user) respectively and are located in the following locations (note that folder names might be localized or personalized on your operating system version. Those folder names appear in [brackets]):

Presets Location on a Mac computer:

Local Library: /Library/Audio/Presets/Waldorf/PPG Wave 3.V/

User Library: [User home directory]/Library/ Audio/ Presets/Waldorf/PPG Wave 3.V/

Preset Location on a Windows computer

Local Library: [PPG Wave 3.V installation path]\Waldorf\PPG Wave 3.V Sounds

User Library: [Documents And Settings]\[User home directory]\[Application Data]\Waldorf\PPG Wave 3.V\

Further folders can be added and removed at will but we strongly recommend to not add an entire hard disk or other huge folder structure since scanning those might take a very long time and if the number of found items is huge, PPG Wave 3.V might behave unpredictably.

Working with the File Browser

The view is divided into two columns. The first column shows the file or folder name, the second the last modification date. Folders have a small triangle to their left to reveal or hide their content.

Files or folders that are added to the tree by either dropping them onto the file browser or by using the context menu items “Add...” or “Duplicate” are always created with unique file names. These file names are created in the style “original_name number.extension” where “original_name” refers to the original file name without extension, “number” refers to a unique number starting at 1, which is incremented until a unique name is found, and “extension” refers to the original file extension.

The File Browser offers the following mouse and keyboard functions. Please note that all operations which modify files or folders on disk require sufficient access privileges:

- Click selects a file or folder. Selected items are highlighted with a filled background in a different color.
- 2nd Click renames a file or folder if possible. The root folders cannot be renamed but all subfolders and files can. Note that this doesn't change the name of the Sound in that file, it only changes the name of the file on disk. If a name already exists, the file is not renamed.
- Double-Click on a file loads that file into PPG Wave 3.V. A Program File (.fxp or .aupreset [Mac]) is loaded into the currently active Program location overwriting the Program that was there previously. A Bank File replaces the whole memory of PPG Wave 3.V completely.
- Double-Click on a folder reveals or hides its content.
- Shift + Click selects a contiguous range of files and folders.

- Command + Click [Mac] / CTRL + Click [Windows] adds a file or folder to or removes it from the current selection.
- Right Click (also CTRL + Click on Mac) opens a context menu with the following menu items:
  - **Open** – loads the selected file into PPG Wave 3.V.
  - **New Folder...** – creates a new folder on disk inside the selected folder or the enclosing folder if a file is selected. Upon successful creation, the folder can be renamed.
  - **Add...** – shows a file select dialog to select files that are copied into the selected folder or the enclosing folder if a file is selected.
  - **Rename...** – renames a file or folder if possible. The root folders cannot be renamed but all subfolders and files can. Note that this doesn't change the name of the Sound in that file, it only changes the name of the file on disk. If a name already exists, the file is not renamed.
  - **Duplicate** – duplicates the selected files or folders and renames them uniquely.
  - **Move to Trash** – moves the selected files or folders to the system trash.
  - **Reveal in Finder** [Mac] / **Reveal in Explorer** [Windows] – reveals the selected files or folders in a Finder [Mac] or Explorer [Windows] window.
  - **Add Scan Folder...** – shows a folder select dialog to select a folder that is scanned for folders and files with known file types and adds the result to the File Browser view. No files are copied by this command, the selected folder is only added to the view tree. All added scan folders are stored in PPG Wave 3.V's preferences when PPG Wave 3.V is closed and they are added to the File Browser automatically on subsequent launches.
  - **Remove Scan Folder** – removes the selected top-level folder from the list of scanned folders if possible. The main library folders Local Library and User Library cannot be removed, only the custom scan folders can.
  - **Refresh** – refreshes the content of the selected folder or the enclosing folder if a file is selected.
  - **Refresh All** – refreshes the content of all folders.

- Arrow Keys Up / Down select the previous / next file or folder in the file browser.
- Arrow Keys Left / Right close or open a selected folder.
- Return (or Enter) loads the selected entry into PPG Wave 3.V memory. A Program File is loaded into the currently selected program, a Bank File replaces the whole memory of PPG Wave 3.V.

Dragging:

- **Move** – Drag and drop inside the File Browser or between the Finder [Mac] or the Explorer [Windows] moves the selected files or folders to the highlighted folder. Note: the files and folders are *moved*, so they are *removed* from their original location and created at their new location. If you don't want that, use the copy command below.
- **Copy** – Holding Option [Mac] or Alt [Windows] during the drop operation copies the selected files or folders to the new location.
- **Load** – Drag of selected files to the Program Table loads them into PPG Wave 3.V RAM starting at the highlighted location.

The Analog Control Panel

BASIS

The **BASIS** dial controls the position of voices within the stereo panorama (pan). If this is set to 0, all voices are audible in the middle of the stereo spectrum. If you turn it to the right, voices in POLY mode alternate between a left and a right pan position. In DUAL, QUAD and MONO modes, voices are equally spread within the stereo spectrum. This function only makes sense, if you monitor your audio signal in stereo.

In contrast to the original PPG, where it could happen that two consecutive voices would sound on the same channel, voices in the PPG Wave 3.V always sound alternatively for each channel.

VOLUME

This dial is used to set the overall output volume of the PPG Wave 3.V. It is a good idea to lower the Volume value, if a sound tends to distort anyway because of its settings.

LOW FREQ OSCILLATOR (LFO)

LFO (Low Frequency Oscillator) is an oscillator that creates an oscillation below the threshold of audibility. This can be used to continuously control different parameters (e.g. to control the WAVES, the FILTER or the pitch of the oscillator).

The PPG Wave 3.V's LFO offers four different oscillator waveforms as modulation signal. Modulation intensity can be controlled with the modulation wheel (MODWHEEL). If it is fully turned down, no modulation takes place. Same as on the original PPG Wave synth, the Modulation wheel setting is saved with each Program. Make sure that the **TOUCH** parameter in the MODULATION panel is set to OFF, otherwise the LFO will only modulate the signal if Aftertouch data is generated at the same time.

The LFO can also be synchronized to the Song tempo of your host application by clicking the red LED next to the RATE knob.

The original PPG LFOs were calculated with a very low update rate, as back then the available processor power had to be carefully distributed to the various tasks. In the PPG Wave 3.V you can get the same low update rate if you activate TRUE PPG.

DELAY

This parameter enables a time delayed LFO modulation.

If TRUE PPG is deactivated, DELAY doesn't have an impact when set to zero. If TRUE PPG is active, the LFO is faded in with any new key that you press, irrespective of the DELAY parameter setting.

WAVESHAPE

The LFO can create the following four waveforms: Triangle, falling saw tooth, rising saw tooth and Square. You can use this control to select one of these waveforms.

Same as on the original PPG, the LFO waveform Square jumps between "no modulation" and "full positive modulation". The other three waveforms oscillate between "full negative modulation" and "full positive modulation". You can clearly notice this effect, if you activate MOD>FILTER and switch back and forth between the various waveforms.

LFO *Waveshape* and *Rate* can also be edited within the Graph menu.

RATE

The **Rate** dial controls the LFO's speed. If this is set to its minimum value, the LFO operates with 0.09 Hz (one cycle in 10,6 seconds). If Rate is set to its maximum value, the LFO speed reaches 24 Hz (i.e. 24 cycles per second). If **CLK** (Clock) is activated, the LFO speed can be selected in musical steps (from 1/32 to 128 bars).

If TRUE PPG is activated, higher LFO rates produce unpredictable but rhythmical modulations as in the original PPG.

CLK (Clock)

The **Clock** button synchronizes the LFO to the tempo of your host application. If activated the corresponding LED lits red. Additionally a small arrow lits up. Click on it to open a pop-up menu for faster selection of LFO rates with musical steps.

Again, TRUE PPG has influence on the modulation. If activated, the LFO modulation is slightly shifted.

ENVELOPES

An Envelope creates a variable control signal. It is for instance used to modulate the filter settings of a sound within a given period of time. The classic Envelope form consist of four separately controllable phases: Attack, Decay, Sustain and Release, which is why it is also called ADSR Envelope. If you press a key, the Envelope is started. Within the period of time that you have defined with the **ATTACK** parameter, it first rises to its maximum value. Then it needs the time set with the **DECAY** dial to fall to the level set with the **SUSTAIN** dial. It remains there until you let go of the key. Then the Envelope sinks back to zero within the period of time that you have set with the **RELEASE** dial.

The PPG Wave 3.V has two unipolar ADSR envelopes and one AD envelope with positive or negative deflection, which can also be edited graphically. Find additional information in the section “The Graphical Editor (Graph)”.

The original PPG Wave 2.2 and 2.3 saved only a few rates that have displayed. Attack rates were saved with only 16 steps, e.g. values as 0, 4, 8, 12 and so on. Decay and Release rates were saved with 32 steps (0, 2, 4, 6 etc.). If TRUE PPG is activated, the PPG Wave 3.V plays also these reduced rates. Deactivate TRUE PPG if you want to have all values of an envelope rate for a smooth sound control.

In the Appendix of this manual you will find a more detailed explanation of envelopes.

The original PPG had an especially interesting feature, which can of course always be found in the Plug-In. If the Attack Rate of an Envelope was set to a value higher than 47, then the signal would execute the Attack-phase completely, no matter if the note was still played or not. The Envelope would always switch into the Release-phase. This function is especially useful for long filter-sweeps. For this to work, Envelope 2, which controls the volume, must of course also be set correspondingly.

ADSR ENVELOPE 1

This Envelope is used to control the filter frequency and the waveforms. The four dials control the exact Envelope form and time-wise modulation development. The impact of the Envelope on the filter frequency can be adjusted with the ENV1-VCF parameter, the intensity of waveform modulation is changed with the ENV1-WAVES parameter.

Although only common controllers are available for this envelope, the calculation is done twice. The waveform envelope is a little bit faster than the filter envelope and has to wait after each envelope phase until the filter envelope matches the phase. If so, the next phase starts automatically.

Short settings for Attack, Decay or Release will be ignored by the waveform envelope. This prevents the typical click sound that occurs within the PPG Wave 2.2 and 2.3.

ADSR ENVELOPE 2

This Envelope is used to control level development. The four dials control the exact Envelope form and time-wise modulation development of the sound's level. The intensity of this Envelope can be controlled with the ENV2 VCA parameter.

AD ENVELOPE 3

This Envelope can be assigned to different modulation targets. Attack and Decay behave as usual, but the signal always travels through the Envelope completely, no matter if a note is held or not.

If ENV3>OSC or ENV3>SUB in the TUNE menu are active, Envelope 3 modulates the pitch of the corresponding oscillator. ENV 3 ATT either creates a negative (when turned counter clockwise) or a positive (when turned clockwise) Envelope deflection.

If SUB-WAVES in the DIGITAL menu is set to ENV3, then Envelope 3 modulates the sub oscillator waveform. In this case, only the positive deflection form of ENV 3 ATT can be used.

All three Envelopes can also graphically be edited in the GRAPH editor.

MODIFIERS

This section creates the actual sound. Two Wavetable oscillators (OSC and SUB) as well as a low pass filter with resonance capability.

Sound creation in the PPG Wave 3.V bases on waveform sets, called Wavetables. You should think of these as a

sequence of 64 single Waves. This can be played back in a static way or passed through dynamically, which results in the PPG-typical interesting sound transformations. If the Waves do not differ much, then the Wavetable will probably sound smooth and pleasant. If they have a completely different structure, this will result in abrupt spectral changes.

More information about Wavetable synthesis can be found in the Appendix of this manual.

The PPG Wave 3.V offers nearly 140 Wavetables and the last four Waves of each of the classic Wavetables are always the classic analog waveforms Triangle, Pulse, Square and Saw tooth. You should thus first use these four waveforms, if you want to create typical analog sounds. The new Wavetables don´t offer these analog waveforms.

Additionally, you have the UPPER WAVES, another Wavetable, which is always available on all MIDI channels. Please also read the section “Upper Waves”. New Wavetables with the letter “U” don´t offer the Upper Wavetable because they contain already 128 different waves.

CUTOFF

Similar to the original, the PPG Wave 3.V contains a low pass filter with resonance capability and a slope rate of 24 dB per octave. Additionally it is switchable to 12 dB per octave. The original PPG doesn´t offer this slope rate. The filter attenuates frequencies above the corner frequency set with the dial. Turning the dial clockwise opens the filter, so that all frequencies can pass unchanged when the dial is fully up. Turning the dial counterclockwise closes the filter. When the dial is turned down, you won’t hear anything, same as on the original PPG.

The **Slope** button reduces the slope rate to 12 dB per octave.

More information about how a filter works can be found in the Appendix of this manual.

EMPHASIS

Emphasis, often also named Resonance, emphasises a narrow frequency band around the corner frequency. Lower settings between 15 and 50 make the sound more brilliant and nasal and give it the typical filter character. Please note that higher settings attenuate the level in the

same way as the SSM 2044 filter chip did in the original PPG 2.2/2.3.

PPG users do especially like the typical sound character that results from high Cutoff and Emphasis settings. Caused by the combination with the waveforms, the sound becomes extremely thin and delicate.

DRIVE

Determines the amount of saturation that is added to the signal. If set to *0*, no saturation will be added or, in other words, the signal will remain clean. Lower values will add some harmonics to the signal, resulting in a warm character. Increasing the value will bring in more and more distortion, suitable for harder lead sounds and effects.

Use the **Drive** button in the Panel section to change the characteristic of the saturation from a hard transistor distortion to a tube saturation.

Waves-Oscillator (OSC WAVES)

Waves-Oscillator controls the starting point of the Wavetable (or a loaded Transient) selected in the DIGITAL panel. If you want to create a sound that travels through the Wavetable, then you should at least roughly set the starting point in the desired Wavetable area. Keep in mind, that the last four Waves 60 to 63 are the same in all Wavetables, so that unwanted "jumps" can occur during the pass. This method helps you to find the basic character of the sound, to which a modulation (e.g. caused by the LFO, the Envelope or by Key tracking) is assigned.

When a Transient is loaded the startpoint of the sample can be moved in steps of 128 samples. A value of *0* starts the sample from the very beginning, a maximum value of *63* moves the startpoint to 8064 samples.

Waves-Sub-Oscillator (WAVES SUB)

Depending on the setting of the SUB-WAVES parameter in the DIGITAL panel, the WAVES-SUB parameter selects a certain waveform. Please find more information in the section "DIGITAL Panel".

Within sound memory, the current and Upper Wavetables are arranged in the form of a sequential ring. If you thus create a modulation that exceeds the 63rd Wave, then the corresponding Waves of the Upper Wavetable become audible. The same goes for modulations below *0*. You simply use the parameter UPPER WAVES to replace the Wavetables of the oscillator. The SUB-WAVES parameter controls whether the sub oscillator also uses these replaced Wavetables.

MODIFIERS CONTROL

This is where you control the impact that both ADSR Envelopes have on the respective modulation target.

ENV 1 VCF

This controls how ADSR Envelope 1 influences the filter frequency. The higher you set this value, the more the filter frequency rises with the modulation deflection of the Envelope. Experiment with **Cutoff** and this control to find out what they do. Note that the Envelope intensity can only use the positive deflection form, same as on the original PPG Wave.

ENV 2 VCA

This controls the influence of ADSR Envelope 2 on the sound level. The higher you set this value, the louder the sound.

ENV 1 WAVES

This controls ADSR Envelope 1's impact on the modulation of the oscillator's Waves. It controls the loop start and loop end when a Transient is loaded.

✻ Try this: Set WAVES-OSC to zero. Set ENV1 WAVES to a value smaller than 60. If you select 60 or higher, you will get into the area of the four "analog" waveforms, which can lead to rough sound jumps (which of course can also be attractive). Now set the ADSR Envelope 1 ATTACK to a value between 32 and 40 and SUSTAIN to zero. Now you can clearly hear the Wave scanning process, i.e. how the sound travels through the Waves of the Wavetable. Using ENV 1 WAVES and/or WAVES-OSC you can now exactly control the Wavetable area through which the sound travels in a certain period of time. You can additionally scan the sub oscillator's Wavetable with ENV 3, which facilitates interesting sound transformations.

Keep in mind that ENV1 WAVES can move a sample loop. Loop length is unaffected.

PANEL FUNCTION

SLOPE 12 DB

Click on this button to change the filter characteristic from 24 dB per octave to 12 dB per octave. The corresponding LED lights up in red.

DRIVE TUBE

Click on this button to change the drive characteristic to an asymmetric saturation that sounds like a valve saturation. If not activated , the drive characteristic is similar to a hard transistor saturation.

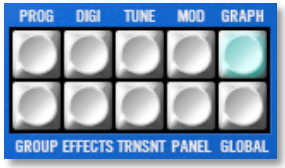
TRUE PPG

If you activate this function, the PPG Wave 3.V is set into a special mode where it shows the same peculiarities in behaviour that its original model showed. The LED lights up in red, if the function is active. According to this parameter the setting of the **PPG WAVE MODE** parameter on the DIGITAL panel is also important.

- You hear the typical aliasing noise of the original PPGs, especially when creating higher notes.

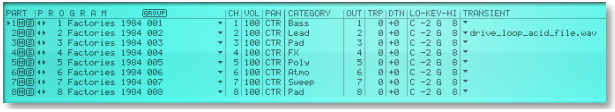
- Wave scanning produces typical click noise as can be heard within the original PPG synthesizers.
- The LFO oscillates irregularly, LFO Delay set to zero fades in the LFO with each newly started note.
- Filter tuning varies slightly to simulate the tuning instability of the analog filter chip.
- Playback quality of Transients is set to 8 Bit mode (PPG WAVE MODE = 2.2) or 12 Bit mode (PPG WAVE MODE = 2.3).
- Envelopes are showing the same behaviour with shapes and rates as in the original PPG synthesizers.

Panel Buttons and Panel Sections



PROGRAM Panel (PROG)

Here you can manage all used Multi parts as also the corresponding samples (Transients). To open the Program panel, press the PROG button on the Plug-In panel. The button lights up in blue.


PART
PROGRAM
GROUP
CH
VOL
PAN
CATEGORY
OUT
TRP
DTN
LO-KEY-HI
TRANSIENT
1 Factories 1984 001 1 100 CTR Bass 1 0 +0 C -2 G 8
2 Factories 1984 002 2 100 CTR Lead 2 0 +0 C -2 G 8 drive_loop_acid_file.wav
3 Factories 1984 003 3 100 CTR Pad 3 0 +0 C -2 G 8
4 Factories 1984 004 4 100 CTR FX 4 0 +0 C -2 G 8
5 Factories 1984 005 5 100 CTR Poly 5 0 +0 C -2 G 8
6 Factories 1984 006 6 100 CTR Rtno 6 0 +0 C -2 G 8
7 Factories 1984 007 7 100 CTR Sweep 7 0 +0 C -2 G 8
8 Factories 1984 008 8 100 CTR Pad 8 0 +0 C -2 G 8

All eight Multi Parts have the same settings that are described on the following pages.

- Part selection: Click into the free area left of the Part number to activate the desired Part. The Control Panel changes automatically to the selected sound program. A small arrow indicates the choosen part.

- The **Mute** button mutes the corresponding part.
- The **Solo** button mutes all other parts.
- **Program Selection** gives you an overview over all loaded sound programs. You can select sound programs by using the arrow buttons.
- Click on the **Group** button to group all eight parts. This is useful when working with Multi samples on different parts to edit them simultaneously. Please read also the chapter about Transients.
- The **MIDI Channel Selection (CH)** determines the MIDI receive channel for the selected Part. *1…16* means that the selected Part recieves MIDI data on the choosen MIDI channel. This setting is useful when working within a sequencer arrangement with different PPG Wave 3.V sound programs.

If you want to playback Multi samples or layered sounds you can set all Parts to the same MIDI channel.

- **Part Volume (VOL)** determines the volume for the selected Part.

The **Volume** parameter sets the maximum output volume of the selected part. If you use MIDI Controller *#7* (Channel Volume) to change the volume of the Instruments that receive on this MIDI channel, the real output level is scaled to the volume set up in this parameter. This means that if you set **Volume** to *10* and Controller *#7* to *127*, the maximum output volume is *10*.

- **Panorama (PAN)** determines the position in the stereo panorama. When the setting is *L64*, the sound is panned far left; when the setting is *R63*, it is panned far right. If you want to situate the sound in the middle of the stereo panorama, use the *CTR* setting.
- In the **Category Column (Category)** you can enter any category name (e.g. Bass, Lead, Pad etc.). Doubleclick on the desired category area to open a text field.
- **Output (OUT)** determines the output of the selected part where the audio signal is routed. PPG Wave 3.V offers 8 stereo outputs which can be activated in the **Global** menu.
- **Transpose (TRP)** sets the pitch of the selected Part in semitone steps. I.e., a value of *-12* means that the part

sounds one octave lower than it was originally programmed.

- **Detune (DTN)** fine-tunes the selected part in steps of 1/64th of a semitone.
- **Lo Key** range can be restricted fort he part´s tone generation. Only notes with the key number higher or equal to the selected value are passed through. Set this parameter to *C-2* if you want to use the full keyboard range.
- **Hi Key** ist he counterpart to the **Lo Key** paramater. Only notes with a key number lower or equal to the selected value are passed throug. Set this parameter to *G8* if you want to use the full keyboard range.
- **Transient** is for loading a separate sample for each part. This is similar to the parameters in the DIGITAL and in the TRANSIENT menu. If you set up samples for up to 8 programs you can see an overview of the loaded samples. Alternatively you can load 8 corresponding samples (so called Multi samples) and set up with Hi Key and Lo Key to play it as one single sound (by using the same MIDI channel). Click on the corresponding arrow button to open a context menu and choose "Load Transient...". "Clear" removes a loaded Transient.

More information about Transients and their usage can be found in the chapter "Transient Menu".

What is a Multi sample?
A Multi-Sample is a bunch of different recordings of the same single sound in different pitch ranges or with different articulations. Since harmonics' characteristics of most sounds change enormously over the tone ranges and when played differently, Multi-Samples are the only way to capture all nuances of the entire sound. PPG Wave 3.V allows to map up to 8 samples on your keyboard to receive a more natural sound.

If you have loaded a Transient, Wavetable playback is disabled for the corresponding Program.

DIGITAL Panel (DIGI)

The Digital panel lets you access the Wavetable parameters, their modulation and the Arpeggiator. To open the Digital panel, press the DIGI button on the Plug-In panel. The button lights up in blue.

The following sections describe the individual functions in detail.

TRANSIENT

Here you can load a desired sample. Click on the arrow button to open a context menu and choose "*Load Transient...*". "*Clear*" removes a loaded Transient. Drag & Drop of samples from Explorer (Windows) and Finder (Mac) is also supported. More information on Transients and their usage can be found in the chapter "Transient Menu".

⚠ **If you have loaded a Transient, Wavetable playback is disabled for the corresponding Program.**

WAVETABLE *Diverse*

This parameter is used to select the Wavetable for both Wave oscillators. Nearly 140 Wavetables are available, spread over various banks. Click on the left and right arrow buttons to select the desired wavetable. Alternatively you can click on the arrow down button to open a pop up menu for faster selection.

ℹ A list of all Wavetables and Banks can be found in the Appendix of this manual.

The Wavetables are the PPG Wave 3.V's driving force. To make sure that you fully use this power, you should familiarize yourself with the sound and the characteristics of each Wavetable.

To travel through the Wavetables it is advisable to first initialize a Program. Continuously hold down a key on the keyboard (preferably the note C4). Envelope 1 is programmed to slowly travel through all Waves of the selected Wavetable (except for the last four "analog" waveforms). Change the Wavetable to hear how the various Wavetables sound. You will find that they cover a wide spectrum of interesting sound colours, including analog, FM typical or bell-type sounds. If you wish to increase the "travel speed", then decrease the Decay value of Envelope 1 correspondingly.

⚠ **If you have loaded a Transient, Wavetable playback for the corresponding Programm is disabled.**

BANK *Diverse*

Bank chooses a desired presets bank containing different wavetables. Click on the horizontal arrow buttons to switch between the banks. Alternatively you can click on the arrow down button to open a pop down menu for faster bank selection.

UPPER WAVES *ON / OFF*

In addition to the 64 Waves per Wavetable, Upper Waves are available. This is another Wavetable, which provides another 64 Waves. Click ON to activate the Upper Waves. The Upper Waves reside above the regular Wavetables and expand the Spectrum of the Wave scanning. Only one Upper Waves "Wavetable" is available and it is identical for all Wavetables.

ℹ The original PPG Wave 2.3 could only provide the upper Wavetable to the Sound on the first Part. In the PPG Wave 3.V UPPER WAVES can be active on each channel.

SUB-WAVES *OFF, OFFSET, DIRECT, ENV 3*

Use this function to activate the Sub Wave oscillator. Four different settings are possible:

- *OFF* switches the Sub oscillator off. The Wave oscillator will sound twice as loud to compensate for the difference in volume.
- OFFSET is the preferred setting. In this mode, the value to which WAVES-SUB is set, is added to the value set for WAVES-OSC. If you e.g.set WAVESOSC to 20 and WAVES-SUB to 10, the oscillator will play Wave 20, while the sub oscillator will play Wave 30. Offset can also be used in connection with the possible Wave oscillator modulations. The switch UPPER WAVES also applies to the sub oscillator in this setting, as this still concerns an Offset between sub oscillator-waveform and oscillator-waveform.
- DIRECT means that WAVES-SUB plays the set waveform directly, and that no modulation can change it. If you e.g. want to perform a Wavescan only for the main oscillator, while the sub oscillator should play a fixed wave, then select this setting. The switch UPPER WAVES has no impact here.

- ENV 3 is identical with DIRECT, except that Envelope 3 is used as the modulation source for the Wave scanning of the sub oscillator. You can use this setting to create oppositely directed Wave modulations of the two oscillators. The switch UPPER WAVES has no impact here.

✻ **SUB-WAVES** has also influence on the Transients playback. You should use it for sound experiments. Load a sample, set **SUB-WAVES** to DIRECT and choose alternative sample start points and loop start points.

Keyboard Mode (KEYB MODE) *Poly, Dual, Quad, Mono*

The Original PPG Wave 2.3 offered several options to stack voices. The SEMITONE parameters in the TUNING menu are directly connected with this function. Not all original modes are found in the Wave 3.V, as it would not make sense because of the dynamic voice assignment that is used nowadays. (Background: The PPG Wave 2.3 offered a maximum of eight voices). The most important and interesting Keyboard modes have been taken over from the original:

- POLY means that an incoming note only creates one voice. In Poly mode only SEMITONE 1 controls the pitch of the played notes (in the Original PPG Wave, this mode was named POLY 8x1).
- DUAL means that an incoming note creates two voices. Here, SEMITONE 1 controls the pitch of the first voice and SEMITONE 2 controls the pitch of the second voice (in the Original PPG Wave, this mode was named QUAD 4x2).
- QUAD means that each incoming note creates four voices. Here, SEMITONE 1 to 4 control the respective pitch of the four voices (in the Original PPG Wave, this mode was named DUO 2x4).
- MONO means, that each incoming note creates eight voices. Again, SEMITONE 1 to 8 control the respective pitch of the eight voices (in the Original PPG Wave, this mode was named MONO 1 x 8). Please note, that only one note at a time can be played. If you create another note while the first one ist still held, then the first will be cut off. The note is not memorized. If you thus let go of the note of a chord, no older note becomes audible.

Please read also the section SEMITONE in the chapter TUNING Panel.

PPG WAVE MODE *2.2 / 2.3 / 2.V*

Sets the quality for wavetable and sample playback.

- *2.2* means, that the playback quality is similar to the original PPG Wave 2.2. Samples will be played back with a quality of 8 bit and no further interpolation. This results in a characteristic aliasing and bristliness of the sound.
- *2.3* means, that the playback quality is similar to the original PPG Wave 2.3. Samples will be played back with a quality of 12 bit and no further interpolation, This gives you less aliasing but enough bristliness.
- *2.V* means, that the playback quality is similar to the PPG Wave 2.V plug-in. Samples will be played back with the original quality up to 32 bit and with interpolation. Use this setting when you don´t wish any sound quality loss.

To hear the different playback quality, the **TRUE PPG** parameter must be activated, otherwise the playback quality is automatically set to high quality.

ARP ACTIVE *ON / OFF*

An Arpeggiator splits an incoming chord into single notes and repeats these dynamically. Different pattern presets can be used.

The PPG Wave 3.V Arpeggiator has a very simple structure and serves as a source for sound sequence ideas and as a fun generator.

If you set Arp Active to On, the Arpeggiator is switched on. Play a chord on your MIDI keyboard to hear the effect.

ARP MODE *Up, Down, Alt, Rnd, Moving*

This parameter is used to determine the succession of created notes depending on their pitch.

- If this is set to UP, the Arpeggio starts with the lowest note and then plays upwards to the highest note. Then it starts over again with the lowest note.
- If this is set to DOWN, the Arpeggio starts with the highest note and then plays downwards to the lowest note. Then it starts over again with the highest note.

- If this is set to ALT (alternating), the Arpeggio starts with the lowest note and then plays upwards to the highest note. Then it reverses course and plays the notes starting with the highest and ending with the lowest note.
- The RND (Random) setting creates a random Arpeggio based on the notes of the played chord.
- The MOVING setting creates an Arpeggio with an interleave pattern. The note succession with five keys pressed is as follows: 1-2-1-3-2-4-3-5-4-5-1-2-1-3-2-4...

ARP RATE

2/1...1/32

Arpeggiator Rate lets you control the note length of the created individual notes. You can set values from a whole note to a 32th Triplet. The 4/4 time signature and the current Song tempo of the host application are used. Triplets (e.g. 1/8T) and dotted notes (e.g. 1/16) are available for each note value. Use the pop-up menu for a fast selection of the desired value.

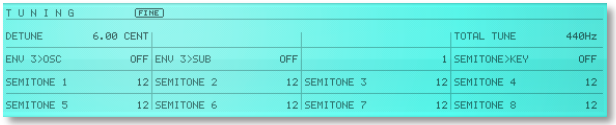
ARP RANGE

1...4 OCTAVE

Using Arpeggiator Range, you can control the number of octaves used for the Arpeggio.

TUNING Panel (TUNE)

The Tuning panel lets you access all parameters that concern the tuning and pitch modulation of the Plug-In. To open the Tuning panel, press the TUNE button on the Plug-In panel. The button lights up in blue.



DETUNE

0 Cents...2 Oct

You can use this parameter to detune the sub oscillator in relation to the main oscillator and get flanging or chorus-type effects, or musically useful intervals. These settings are possible:

- The setting 0 CENTS does not create a detuning effect.
- The setting 3 CENTS detunes the sub oscillator by 3 cent.
- The setting 6 CENTS detunes the sub oscillator by 6 cent.

- The setting 12 CENTS detunes the sub oscillator by 12 cent.
- The setting 24 CENTS detunes the sub oscillator by 24 cent.
- The setting 7 SEMI detunes the sub oscillator by 7 semitones (a Fifth) upwards.
- The setting 1 OCT detunes the sub oscillator by one octave upwards.
- The setting 2 OCT detunes the sub oscillator by two octaves upwards.

TOTAL TUNE *400...499 Hz*

This parameter changes the overall tuning of the PPG Wave 2.V. The value refers to the reference pitch for MIDI note A3. The standard setting for this is 440 Hz, which is used by most acoustic and electric instruments. We recommend that you only change the overall tuning, if you are sure of what you're doing. Please keep in mind to adjust the tuning of all other used instruments, if you change **Total Tune**.

We have no idea, why this parameter was adjustable between 400 Hz and 499 Hz in the original PPG. But to keep the charm of the original, we have implemented it in the same way.

ENV 3>OSC *ON / OFF*

You can use this parameter to select the AD-Envelope 3 as a modulation source for the pitch of the main oscillator. You can use this to create a rising pitch in the Attack phase, for example. Using ENV 3 ATT on the analog user interface, you control whether the deflection should be positive or negative.

ENV 3>SUB *ON / OFF*

You can use this parameter to select the AD-Envelope 3 as a modulation source for the pitch of the sub oscillator. Using ENV 3 ATT on the analog user interface, you control whether the deflection should be positive or negative.

SEMITONE>KEY *ON / OFF*

If active, all eight SEMITONE settings will be cycled upon each note. To hear this effect you have to set the **KEYB MODE** parameter in the DIGITAL panel to *Poly*.

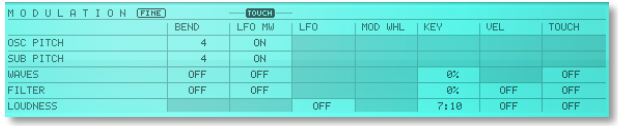
SEMITONE 1-8 *0...63*

These parameters are directly connected to KEYBOARD MODE in the DIGITAL panel (also see the section “Keyboard Mode”). They are used to define the pitch of the individual voices in the different play modes in semitone steps. If you set a Semitone value to “0”, then the corresponding semitone will wind up in the 32′ octave range. If you set it to “12”, it winds up in the 16′ octave range etc.

- SEMITONE 1 controls the pitch in POLY mode.
- SEMITONE 1 and 2 control the pitches in DUAL mode.
- SEMITONE 1 to 4 control the pitches in QUAD mode.
- SEMITONE 1 to 8 control the pitches in MONO mode.

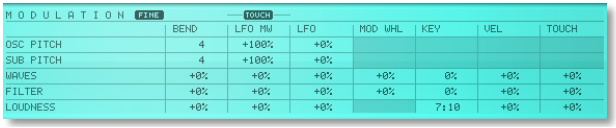
MODULATION Panel (MOD)

You can use the Modulation panel to make various settings that concern the modulation sources and their respective targets. The Modulation panel offers a fast editable modulation table. To open the Modulation panel, press the MOD button on the Plug-In panel. The button lights up in blue.



The x-axis of the modulation table contains all modulation sources. The y-axis contains the modulation destinations. Click on a corresponding intersection to activate the desired modulation or to change the modulation amount.

Activate the FINE parameter button in the upper area to add additional modulations that were not possible in the original PPG Wave. It offers also more detailed modulation amounts.



The regular modulation table doesn´t offer modulation amounts in many cases. Instead an ON/OFF function as in the original PPG Wave is available. Besides this not all modulations are possible. If you want to take use of all modulations you should activate the FINE parametrer.

Keep in mind, that some modulations are not possible (e.g. Velocity to OSC PITCH). These modulations are greyed out.

The following modulation sources are available:

- BEND offers a modulation by using the pitch bend wheel in the plug-in or on your master keyboard.
- LFO MW offers a combined modulation of the LFO in conjunction with the modulation wheel on your master keyboard. Modulation intensity of the LFO can be controlled with the Modulation wheel. If it is fully turned down, no modulation takes place. You can also use Aftertouch instead of the Modulation wheel. Click on the TOUCH button above the LFO MW source to activate it. Keep in mind that you have to move up the modulation wheel to maximum before you can hear the aftertouch modulation.
- LFO offers a modulation based on the settings of the LOW FREQ OSCILLATOR.
- MOD WHL offers a modulation based on the settings of the modulation wheel on your master keyboard.
- KEY offers a modulation based on the pitch of a played MIDI note.
- VEL offers a modulation based on the velocity of a played note.
- TOUCH offers a modulation based on the Aftertouch of a played note. Keep in mind that your master keyboard has to generate aftertouch data to use this function.

The following modulation destinations are available:

- OSC PITCH means the pitch of the main oscillator.
- SUB PITCH means the pitch of the sub oscillator.

- WAVES controls the waves of a wavetable. This is in fact the most interesting modulation within the PPG Wave 3.V.
- FILTER means the cutoff frequency.
- LOUDNESS means the volume.

On the following pages you can find some interesting modulation examples.

KEY -> WAVES

This modulation allows to play different Waves of a Wavetable with different notes. If this is set to 100%, each key on the keyboard triggers a different Wave. The C1 key triggers the waveform, that you have selected with WAVES-OSC or WAVES-SUB, while higher keys trigger lower waveforms. This reversed direction was used on purpose, as most Wave sets start out with dull waveforms and become increasingly brighter with higher waveform numbers. Most original wavetables were intended to play back from wave 59 to 0. Using this function on Wavetable 0, lets you for instance create an electric piano sound, or you use it on Wavetable 27 to get the famous "PPG choir".

LFO -> WAVES

This modulation uses the LFO as a modulation source for Wave scanning.

TOUCH -> WAVES

Provided that your Master keyboard can generate Aftertouch data, this modulation performs a wave scan using monophonic Aftertouch (Channel Pressure).

BEND -> WAVES

This modulation uses the pitch bend wheel to perform a wave scan. As pitch bend normally snaps to a center setting, it is advisable to also set the Wave oscillator into a center setting. This creates a bipolar modulation. Make sure to set WAVES-OSC to *29*, as otherwise with the maximum deflection of pitch bend, the four analog waveforms of the Wavetable are also read out.

KEY -> FILTER

This modulation determines, the degree to which the filter frequency depends on the played MIDI note. The higher you set this value, the higher the filter frequency will rise during play. For instance, if you set this to 100% and play an octave on the keyboard, the filter frequency changes

by the same amount. Please note that this is a unipolar function, i.e. it only works in one direction.

KEY -> LOUDNESS

This modulation defines the degree to which the level depends on the played MIDI note. A setting of 10:10 will change nothing. Settings of 1:10, 4:10 or 7:10 will cause that lower notes sound less loud while settings of 10:8, 10:5, 10: 2 or 10:1 will cause that higher notes sound less loud.

VEL -> FILTER

This modulation controls the Filter Envelope's influence on filter frequency depending on note velocity values. Use this function to add more expression to your sound.

VEL -> LOUDNESS

This modulation determines the degree to which the volume level depends on note velocity values. Use this function to add more expression to your sound.

The keyboard of the original PPG Wave 2.3 was not able to generate note velocity data, but it had a sensor for Aftertouch. This could be used to vary note velocity. When a key was pressed, the Wave 2.3 calculated the velocity value of the next note, based upon the detected Aftertouch data. To make things easier, we have not implemented this method in the PPG Wave 3.V. It directly uses note velocity.

LFO -> FILTER

This modulation lets you use the LFO as a modulation source for cutoff frequency.

LFO -> LOUDNESS

With this modulation the LFO will continuously modulate the level. Please take special note that this modulation is independent of the Modulation wheel setting. The LFO parameter DELAY doesn't have any impact on this parameter. You can use this parameter to create a continuous Tremolo effect.

TOUCH -> FILTER

Provided that your Master keyboard can generate Aftertouch data, this modulation lets you control the

deflection of the Filter Envelope – as set with the ENV 1VCF dial – by using monophonic Aftertouch (Channel Pressure).

TOUCH -> LOUDNESS

Provided that your Master keyboard can generate Aftertouch data, this modulation lets you control volume – as set with the ENV 2VCA dial – by using monophonic Aftertouch (Channel Pressure).

BEND -> OSC PITCH

This modulation controls the pitch changes of the main oscillator in semitones that you make with the Pitch Bend wheel.

BEND -> SUB PITCH

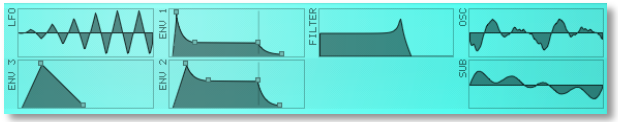
This modulation determines the maximum pitch change in semitones that can be reached using the pitch bend wheel.

BEND -> FILTER

This modulation controls the filter frequency with the pitch bend wheel. Please keep in mind that the pitch bend wheel is a bipolar modulation source. It can produce both positive and negative values.

The Graphical Editor (GRAPH)

In the Graphical Editor, you can quickly and easily edit the Envelopes, the LFO, both Wave Oscillators and filter response curve with the mouse. Editing is simplified by the fact that you see the graphic changes in the corresponding function. To open the Graphical Editor, click on the GRAPH button. The button lights up in blue.



Handling of the Envelopes and the Filter Response

To edit, click on the respective handle and drag into the desired direction. The changes and their parameter names are additionally visible in the display.

Please keep the following in mind:

- The AD Envelope 3 only has two parameters: ATTACK and DECAY.
- ADSR Envelope 1 and 2 are structured identically. ATTACK, DECAY and RELEASE are time-dependent parameters, which is why they can only be moved horizontally. SUSTAIN represents a level, not a time period, and can therefore be moved only vertically.
- The Filter Response graph controls both Cutoff and Emphasis. The filter frequency can be set in horizontal direction, the Resonance is set in vertical direction. Click directly into the graph and set both parameters as desired.
- You can also doubleclick on any value to open a text field for direct value input.

Handling of the LFO Graph

Click and hold in the graph and move your mouse horizontally to change the LFO speed (RATE). Moving vertically changes the LFO waveform (WAVESHAPE).

Handling of the Wavetable Graphs

Click and hold in the corresponding graph and move your mouse up or down to fastly “scan” the loaded wavetable. If you prefer a slower scanning please move the mouse horizontally.

The GROUP Button

Click on this button to activate the Group function. No additional menu is available. The buttons lits blue when activated.

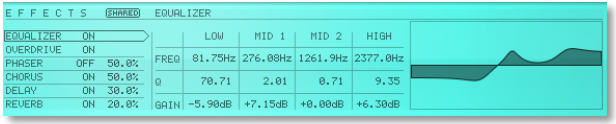
When grouped, all eight parts can be edited simultaneously. This is useful when working with Multi samples on different parts. Please read also the chapter about Transients.

Example: If you change the CUTOFF parameter in Part 1, it will also be changed on Part 2 to 8. Some parameters are not affected by the Group functions, as CHANNEL, VOLUME, Key-Ranges etc.

Click on the GROUP button again to deactivate this function.

The Effects Panel (EFFECTS)

The Effects panel offers a wide range of different effects for the PPG Wave 3.V sound programs. To open the Effects Panel, click on the EFFECTS button. The button lights up in blue.



The PPG Wave 3.V offers a separate effects unit for each Part. Click on the **SHARED** button when you want to use the effects form Part 1 for all other parts.

Click to **OFF** or **ON** to deactivate or activate the corresponding effect as desired.

Click on the corresponding effect name to display parameters for editing.

Some effects (Phaser, Chorus, Delay, Reverb) offer a Mix parameter. This parameter controls the volume ratio between the original signal and the effect output. If set to *0%*, the dry signal is sent to the outputs only so that no effects can be heard. Higher values will increase the effect

signal. At maximum setting, the pure effect signal will be heard.

EQUALIZER

The PPG Wave 3.V offers a parametric equalizer to adjust the sound frequencies to your needs. The equalizer contains four similar structured bands with the following parameters. Low and High band offers shelving characteristic, both mid bands offer bell characteristic:

- **Gain** raises or lowers the volume of the selected frequency.
- **Freq (Frequency)** sets the frequency at which the tones will be affected.
- **Q** widens or shortens the frequency range of the current band. Low and High band offer additional shelving characteristics with overshots and undershots.

OVERDRIVE

The Overdrive effect distorts the input signal by amplifying it drastically and clipping the resulting signal to a certain output level. The difference between this Overdrive effect and the Drive parameter of the Filter section is that Drive affects one single voice, while this effect type distorts the summed output of the whole instrument. Therefore, the resulting effect is different as soon as you play more than one note and you should consider which is best suited to a particular sound program. The Overdrive effect, for example, works great on Organ or E-Piano sounds.

Type *Diverse*

Determines the character of the drive. The following drive curves are available:

- **Light** produces a symmetric light distortion.
- **Medium** produces a symmetric intermediate distortion.
- **Hard** cuts the signal at a certain level.
- **Clip** generates a typical digital clipping.
- **Tube** simulates the asymmetric distortion of a tube circuit.

Drive *0…100%*

Controls the amount of distortion the effect produces. Low values create no or only slight distortion while high values create heavier distortion.

Post Gain *0…100%*

Controls the output level of the distorted signal

Tone *11.56 Hz…18795 Hz*

Dampens the high frequency output of the Overdrive effect.

Emphasis *0…100%*

Controls the emphasis of the frequencies around the **Tone** cutoff point. Use lower values in the range of *15…50* to give more brilliance to the Overdrive effect.

PHASER

A Phaser is a combination of several "allpass" filters working in parallel. This generates an effect with equally spaced frequency peaks or throughs. The result is a strongly colorized signal with a "spacy" character.

A Mix setting of 48 to 96 produces the strongest effect because both the unaffected signal and the processed signal are mixed together.

Stages *2...12*

Sets the number of Chorus stages. Higher settings result in a denser effect.

Frequency *11.56 Hz…18795 Hz*

Sets the LFO speed of the Phaser effect.

Mod Speed *0...20 Hz*

Sets the modulation depth of the Phaser effect.

Mod Shape *SINE, TRIANGLE*

Determines the shape of the modulation source for the Phaser effect.

Spacing *0...100%*

Controls the relative frequencies of the allpass filters. A setting of *0* produces a classic phaser, while higher settings spread out the frequencies of the allpass filters.

Feedback *0...100%*

Controls the feedback amount of the delay signal.

Mod Depth *0...100%*

Determines whether the feedback signal is fed back into the Phaser as is, or is inverted beforehand.

Mod Spread *0...360*

Sets the modulation depth of the Phaser effect in degree.

CHORUS

A Chorus effect is generated by using Comb filters that generate slightly detuned copies of the input signal and mix it into the output signal. The result sounds like an ensemble of several simultaneous sounds, like a choir as opposed to a single voice; hence the name Chorus. The detuning is generated by an internal LFO that can be controlled in speed and depth. The Chorus' high frequency output can be dampened with the Cutoff parameter. The Chorus effect offers besides the known 2 Stage mode (1 left, 1 right) also 4 (2 / 2) and 6 (3 / 3) Stage modes. This results in a far denser chorus effect perfectly suited for lush string or pad sounds. Furthermore, it sports feedback, which makes the Chorus also act like a Flanger.

A Mix setting of 48 to 96 produces the strongest effect because both the unaffected signal and the processed signal are mixed together.

Stages *2 / 4 / 6*

Sets the number of Chorus stages. Higher settings result in a denser effect.

Delay *0.023...46.417 ms*

Sets the initial delay that is added to the Chorus delay line.

Mod Speed *0...20 Hz*

Sets the LFO speed of the Chorus effect

Mod Shape *SINE / TRIANGLE*

Determines the shape of the modulation source for the Chorus effect.

Feedback *0.0...100%*

Feeds the Chorus output signal back to its input.

Mod Depth *0.0...100%*

Sets the modulation depth of the Chorus effect.

Mod Spread *0...360*

Adjusts the phase offset of the LFOs of the right stereo output compared to the left and the speed deviation of the additional Chorus LFOs compared to the LFOs of the first two stages. When set to *0*, all LFOs are in sync and the Chorus resembles the sound of old string machines. Higher values result in wider Chorus effects. We recommend a setting of *180* for a wide balanced sound.

DELAY

A Delay is an effect that produces echoes of the input signal. An additional LFO can modulate the delay times.

Clock *ON / OFF*

Synchronizes the Delay to the song tempo of your host application.

Delay *0...2000 or 1/512t...13 bars*

Sets the length of the Delay tap. **Delay** offers a range of usefull musical values. These are only available when Clock is set to *ON*. If activated, a small arrow lits up. Click on it to open a pop-up menu for faster selection of delay times with musical values.

Mod Speed *0...20 Hz*

The delay effect can be modulated in its delay time with the integrated LFO. Speed determines the frequency of this LFO.

Spread *0:100...100:0 %*

Spreads the left and right delay output to half of the delay time maximum. Leftmost and rightmost settings (*100:0 %* or *0:100 %*) create a typical ping pong delay.

Feedback *0...100%*

Controls the amount of signal that is routed back into the Delay line. Lower values therefore produce fewer echoes than higher values.

Mod Depth *0.0...100%*

Controls the modulation depth when delay time is changed by means of the LFO. The depth ranges from no delay to the amount set by the Delay parameter.

Low Cut *41.18...22050 Hz*

Determines the frequency where the lower frequency parts are divided from the effect signal. A natural delay doesn´t produce all frequencies equally, so the highpass cuts the lower frequencies to produce a more realistic delay effect.

High Cut *41.18...22050 Hz*

Determines the frequency where the higher frequency parts are divided from the effect signal. This parameter works in the same way as the lowpass filter in the PPG Wave 3.V´s sound synthesis. A natural delay doesn´t produce all frequencies equally, so the lowpass cuts the higher frequencies to produce a more realistic delay effect.

Low Damp *41.18...22050 Hz*

High pass filter in the feedback loop of the delay. Determines how fast the delay dampens the lower frequencies. This phenomenon makes a natural echo sound somewhat hollow. Higher values of the Damping parameter mean that more low frequencies will be dampened.

High Damp *41.18...22050 Hz*

Low pass filter in the feedback loop of the delay. Determines how fast the delay dampens the higher frequencies. This phenomenon makes a natural echo sound somewhat hollow. Higher values of the Damping parameter mean that more high frequencies will be dampened.

REVERB

The Reverb effect is probably the most widely used effect in music production. It is used to add a realistic ambience to clean and dry audio recorded in a studio. Very complicated mathematical algorithms are needed to simulate the complexity of a natural reverb. As a result, good reverb processors are very expensive. The PPG Wave 3.V's reverb effects don't intend to simulate the perfect natural room, rather they are an addition to the sound synthesis to make it more 3 dimensional and expressive.

Shape *0...100*

Controls the timing proportion of the early reflections to the dimensions of the late reverb. Medium settings roughly result in matching dimensions of the early

reflections to the late reverb. Smaller values change the room to a tube or a reverb plate, bigger values increase the dimensions to around twice the actual room size.

Size

0...100 m

Determines the length of the longest room side in meters. Lower settings simulate a normal room while higher settings simulate a big hall or church.

Diffusion

0...100 %

Determines the consistency of different room materials. Lower settings produce a cold strong reflection like a metal or tile wall. Higher settings make a warm and thick reverb as if the signal were reflected by an uneven surface. Settings above *100* change the room characteristic even further.

Predelay

0…300 ms

Determines the delay in milliseconds between the direct sound and the reverb effect output. A natural reverb contains a reflexion which is heard later than the original signal. The predelay determines this delay so that the reverb is separated from the original sound. Lower settings connect the reverb more to the original signal while higher settings separate the effect signal to produce a more spatious sound.

Feedback

0...100 %

Feedback of the reverb network. Recommended settings are between 1/4 and half of its range. Higher values create audible ringing especially with small **Size** settings, which don't correspond to any natural reverb response, but might be used for simulations of spring or plate reverbs. Maximum setting results in a very long reverb.

Density

0...100 %

Controls the density or diffusion of the early reflections. In real rooms, even the first echoes are smoothed out by the surface and material of the walls. Recommended settings are above center.

Low Cut

41.18...22050 Hz

Determines the frequency where the lower frequency parts are divided from the effect signal. A natural reverb doesn´t produce all frequencies equally, so the highpass cuts the lower frequencies to produce a more realistic reverb effect.

High Cut

41.18...22050 Hz

Determines the frequency where the higher frequency parts are divided from the effect signal. This parameter works in the same way as the lowpass filter in the PPG Wave 3.V´s sound synthesis. A natural reverb doesn´t produce all frequencies equally, so the lowpass cuts the higher frequencies to produce a more realistic reverb effect.

Low Damp

41.18...22050 Hz

High pass filter in the feedback loop of the late reverb. Determines how fast the room simulation dampens the lower reverb frequencies. This phenomenon makes a natural echo sound somewhat hollow. Higher values of the Damping parameter mean that more low frequencies will be dampened.

High Damp

41.18...22050 Hz

Low pass filter in the feedback loop of the late reverb. Determines how fast the room simulation dampens the higher reverb frequencies. This phenomenon makes a natural echo sound somewhat hollow. Higher values of the Damping parameter mean that more high frequencies will be dampened.

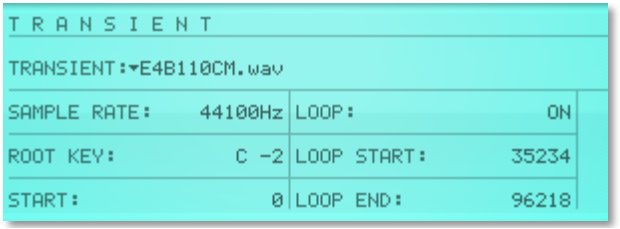
Reverb Examples

All examples with **Feedback** set between 0 and 40.

Room	Size	Shape
Oil Barrel	0-2	0-40
Chamber	2-5	0-40
Room	2-10	~64
Club	10-16	~64
Medium Hall	16-32	~64
Large Hall	32-64	~64
Car Park	50-80	0-40
Underground Car Park	50-80	64-127
Tunnel	100	40
Underbridge	50-70	0-40

Transient Panel (TRNSNT)

The Transient Panel is for loading and managing samples. To open the Transient Panel, click on the TRNSNT button. The button lights up in blue.



Worth Knowing about Transients

The PPG Wave 3.V offers sampleplayback. This is an homage to the original PPG Wave 2.2 and 2.3 in conjunction with the Waveterm or PRK Processor-Keyboard hardware. Samples are called **Transients** in the PPG terminology. You can´t compare the sampleplayback of the PPG Wave 3.V to the playback of modern software samplers as Native Instruments Kontakt or Steinberg Halion. It rather expand the sound diversity of the PPG Wave 3.V and offers a very characteristic and vintage sound. Don´t expect high-end sampleplayback, but you will get nostalgic and expressive sounds.

⚠ **If you have loaded a Transient, Wavetable playback is disabled for the corresponding Program.**

We deliver the PPG Wave 3.V with a bunch of samples that were part of the original PPG sample library.

Of course you can load and playback your own samples.

Stored loop points within a sample will be recognized and played. Keep in mind that the PPG Wave 3.V only supports forward loops. Backward loops or alternate loops won´t be supported. Same is valid for crossfade loops. We recommend to use a suited audio editor software to set loop points and render them into the audio file before using it with the PPG Wave 3.V.

ℹ The Transients are not stored in the programs or banks, only their absolute file path is stored. If you move a sample to a different location on your hard disk or delete it, the Transient field will show “not found”, followed by the file name.

TRANSIENT

Here you can load a desired sample. Click on the arrow button to open a context menu and choose "*Load Transient...*". "*Clear*" removes a loaded Transient. Drag & Drop of samples form Explorer (Windows) and Finder (Mac) is also supported.

The following audio formats are supported by PPG Wave 3.V:

- Waveterm B Library Transients (WTB Disk Images)
- AIFF (root key and loop points are read from the file if they exist), alle sample rates and Bit rates from 8 to 32 Bit
- WAV (root key and loop points are read from the file if they exist), alle sample rates and Bit rates from 8 to 32 Bit
- mp3 (currently Mac-only, no root key or loop read from file)
- Ogg Vorbis (no root key or loop read from file)
- FLAC (no root key or loop read from file)

Keep in mind that stereo samples will be playbacked in mono due to the mono signal path of the PPG Wave 3.V. Only the left channel will be played.

SAMPLE RATE

Shows the original sample rate of the loaded sample. You can edit it by desire to change pitch of the sample.

The sample rate is the frequency representing the amount of individual digital sample scans per second that are taken to capture the original siginal digitally. For normal CD audio recordings 44100 samples per second are used, mostly indicated as a frequency of 44.1 kHz

ROOT KEY *C-2...G8*

The root key defines the original pitch of a recorded instrument or of a sample. Each root key represents a specific key on the keyboard. Lower settings of the ROOT KEY tune down the sample, higher settings tune it up. If a sample was recorded with a pitch that doesn´t match to the ROOT KEY values you can use the SAMPLE RATE for an exact tuning.

START

Start normally marks the beginning of a sample. Higher settings than *0* change the sample start.

LOOP *ON / OFF*

Activates the loop of a sample. WAV or AIFF samples can contain loop information which will be automatically recognized by the PPG Wave 3.V. You can also manually activate a sample loop and set its start and end point.

LOOP START

Marks the start point of a sample loops.

LOOP END

Marks the end point of a sample loops.

If you want to use samples with advanced loop functions we recommend to use a dedicated audio editor like for example Steinberg Wavelab (Mac & PC), BIAS Peak (Mac) or Skylife SammpleRobot (PC).

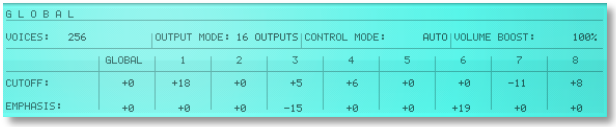
The PANEL Button

You can hide the panel section by pressing the PANEL button.

Click on any other menu button to open the desired panel again.

Global Panel (GLOBAL)

The Global Panel is for common settings of the PPG Wave 3.V. To open the Global Panel, click on the GLOBAL button. The button lights up in blue.


GLOBAL
VOICES: 256
OUTPUT MODE: 16 OUTPUTS
CONTROL MODE: AUTO
VOLUME BOOST: 100%
GLOBAL 1 2 3 4 5 6 7 8
CUTOFF: +0 +18 +0 +5 +6 +0 +0 -11 +8
EMPHASIS: +0 +0 +0 -15 +0 +0 +19 +0 +0

VOICES *1...256*

PPG Wave 3.V offers up to 256 voices. The number of available voices depends on the available processor power.

OUTPUT MODE *STEREO, 16 OUTPUTS*

Here you can select if you want to use the PPG Wave 3.V with a single stereo output or with 8 stereo outputs (16 OUTPUTS). Depending on your host application you may have to restart the PPG Wave 3.V plug-in after changing this parameter.

CONTROL MODE *AUTO, CIRCULAR, LINEAR*

Determines the mouse control for editing knobs in PPG Wave 3.V:

- *Auto* uses the settings of your host application. Please refer to the corresponding manual of your host application.
- *Circular* lets the knob control behave like a real knob. Click on the knob, hold down the left mouse button and drag the mouse around the dial in a circle to change values.
- *Linear* is an alternative knob control. Click on the knob, hold down the left mouse button and drag the mouse up or down to change the value. The knob reacts like a fader.

We recommend the settings *Auto* or *Linear*.

VOLUME BOOST *100...500 %*

This parameter lets you raise the overall plug-in volume.

GLOBAL CUTOFF / EMPHASIS

You can set an offset for Cutoff and Emphasis for each of the 8 Multi parts.

The analog filters of the original PPG had to be tuned with potis. Although the correct settings were written down in the service manual, some units have had variations of these settings which results in a more hollow or brilliant sound. You can emulate this sound by using the GLOBAL CUTOFF EMPHASIS parameter.

CUTOFF 1...8 / EMPHASIS 1...8

The 8 analog filters of the original PPG wave were actually tuning stable, nevertheless changing temperature and other factors could affect Cutoff and Emphasis. To reproduce this behaviour within the PPG Wave 3.V you can set up 8 offsets for CUTOFF and EMPHASIS. Every new played note will be affected by one of these 8 offsets.

Appendix

History

In the end of 1970, the German mastermind Wolfgang Palm and his company PPG (**P**alm **P**roducts **G**ermany) came up with the idea, to copy the sound and behaviour of analog circuits and replace it with a digital representation of oscillator waveforms. In this process, different successive waveforms were stored in Wavetables. While passing through, the sound changed its character, which could be controlled by using envelopes, LFOs or other control sources. This resulted in a sound which continuously changed its character and enabled soft transitions between similar sounding waveforms or extreme jumps between totally different sound spectra. With their additional subsequent analog filters, the PPG synthesizers quickly reach cult status and their typical "Wave sound" could be heard on a great number of music productions of their time. We at Waldorf have successfully on-developed Wavetable synthesis for many years. But there are still many fans of the initial powerful PPG sound around.

How near is the PPG Wave 3.V to the Originaly?

To give you a simple answer: very near! An example: the filter in the original PPG was a SSM 2044 chip. If the resonance was increased, this filter attenuated the input signal by up to 12dB. The PPG Wave 3.V works exactly like that. Furthermore, the resonance of the SSM 2044 had a very special character, which in this form is not implemented in any other filter circuit or IC. If you have the chance to listen to and directly compare both the original and the Plug-In, you will find, that the resonance (or Emphasis, as it's called in the PPG) of both sounds absolutely identical. Another characteristic of the original PPG was its Aliasing noise – actually a side-effect during the reproduction of digital signals – which added an originally undesired noise level to the sound. Actually, it is very simple to create Aliasing. But creating a type of Aliasing that has the same behaviour as on the PPG, is a challenge. In the PPG Wave 3.V you can even choose, whether you want Aliasing of the PPG Wave 2.2, the PPG Wave 2.3 or none.

The only thing, that we did not emulate, was the hum noise of the display back-lighting. We assume, that nobody really wants to use this "feature". There are many more factors, that are responsible for the typical PPG

sound and we are proud to say that we have found them all and reproduced them in our Wave 3.V.

Differences to the Original PPG Wave 2.3

From today's viewpoint, some functions in the original PPG Wave 2.3 are not up-to- date. For this reason, we have made a view changes to the Plug-In user interface, compared to its brother in hardware:

- The naming of the different menus: In the original, there were PROGRAM, DIGITAL, TUNING, ANALOG and SEQUENCE. The ANALOG menu displayed the dial parameters as numerical values in the display. This helped the user to compare between the physical dial setting and the actually set parameter value of the current sound. In the PPG Wave 3.V this menu is not necessary, as the dials show the settings of the selected sound at any time. The SEQUENCE menu was used to call up the built-in sequencer of the original PPG. This had a very simple structure and could in no way compare to the power of a modern software sequencer, which is why we haven't included it in the Wave 3.V. Still present are the Arpeggiator and the possibility to record parameter changes using MIDI Controller messages. In addition, the PPG Wave 3.V has new panels: MODULATION shows all possibilities for modulation within one panel, while the GRAPH paneloffers graphic envelope and filter editing. Other new panels are dealing with the EFFECTS, the TRANSIENTS and GLOBAL functions.
- The second difference lies in the parameter names that are used: On the original PPG, quite cryptic names were used for a number of functions (e.g. MF for the filter modulation or SW for sub-oscillator behaviour). In the PPG Wave 3.V, these names are either not abbreviated or the abbreviation makes sense
- The third difference concerns the display of values. On the original PPG, even switches only used numerical values. The parameter SUB-WAVES, which had the values OFF, OFFSET, DIRECT and ENV3. These were represented by the numbers 0, 1, 2 and 3 (where 3 oddly enough stood for OFF). The PPG Wave 3.V offers an approach that is a little more comprehensible.

Wavetable Synthesis in the PPG Wave 3.V

The sound generation of the wavetables in the PPG Wave 3.V is based on wavetable synthesis. Although wavetable synthesis is not a form of “sample playback”, you should avoid this term because functionality, operation and results are totally different. Each of the wavetables contain 64 single waves.

⚠ **Please keep the terms “wavetable” and “wave” in mind. Don´t mix up!**

The following overview explains how the Wavetable Synthesis works: A wavetable in the PPG Wave 3.V is a table consisting of 64 waveforms. Each waveform is classified by its own special sound character. The main difference of wavetable synthesis in comparison with other sound generation principles is the facility not only to play one waveform per oscillator, but also to walk through the wavetable via different modulations. Therefore you can create wavetable sweeps. The results can be dramatic - much more so than those any sample playback based system could ever produce. This is a unique feature of wavetable synthesis.

This principle offers powerful capabilities. To give some examples:

- Each note on a keyboard can access a different wave of a wavetable.
- Different waves can be played depending on key velocity.
- A LFO can modulate the position within the wavetable. You can create subtle to drastic sound changes.
- User-selected controllers e.g. the mod wheel, can change the position within the wavetable. When you turn the wheel while playing a chord, each note´s wave will be modified intantly.

You should keep the following sentence in mind:

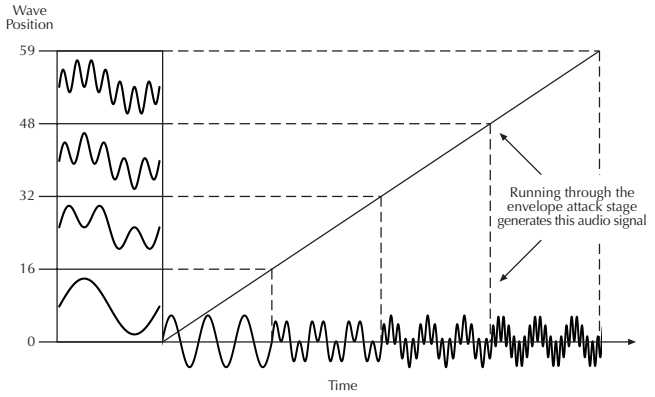
ℹ A wavetable is a list with 64 waves, among which you can move at will.

Modulating Waves over time

The graphic below shows a wavetable and some of its contained waves from position 0 to 59 on the vertical axis. The positions 60 to 63 are excluded since they usually contain the four analog waveforms.

When you set WAVES OSC to 0, ENV 1 -> WAVES to 59 and ENV 1 ATTACK to some medium value, the horizontal axis represents the audio signal that is

generated and the diagonal line in the graphic shows the attack stage over time.



As soon as you play a note the envelope moves through the wavetable positions generating different waveforms over time.

The decay stage would move through these waves in the opposite direction while ultimately holding a certain wave at its sustain stage. When you release the note, the envelope decays to zero.

Most Wavetables are created so that they start with a hollow wave at position 0 and go through increasingly brighter waves up to position 59. This results in a behaviour similar to a low pass filter so that they can be controlled conveniently by an envelope.

If Attack is 0 and Decay set to a medium value you get a percussive sound, if you turn up attack, you get a soft sound start.

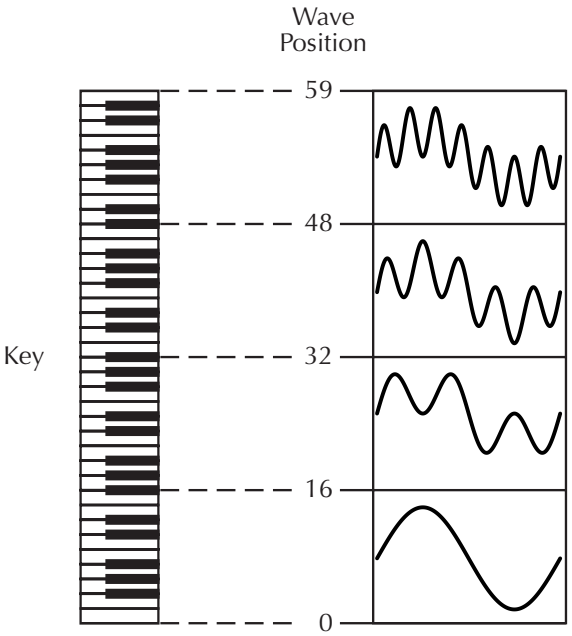
You can also use an LFO to modulate the wavetable position and, depending on the selected LFO Shape, you might get a wave scanning that goes back and forth (triangle), only into one direction followed by a hard reset to the origin (sawtooth up or down) or between only two waves (square)..

Using the Keyboard to access certain Waves

There are sounds with very strong so-called fixed formants caused by a resonant body, e.g. a human voice or a choir, where you need a different waveform for every key.

This can be achieved with the KEY -> WAVES parameter. If its set to +100%, a different wave is played for every key. Because usually the lower notes have the richest harmonics and these waves are located at the highest position in most wavetables, this parameter acts reversed. So, set WAVES OSC to 59. Then the wave position

decreases by one for each following semitone starting at B0 (MIDI Note #35).



Exceeding the 64 Waves

You can also combine KEY -> WAVES with ENV 1 -> WAVES, or even apply further modulations. All these modulations are summed, which might result in over- or underrunning the borders of the Wavetable. If this happens, the Waves of the so-called Upper Wavetable are accessed. In the PPG Wavetable Bank ORIGINAL, the Upper Wavetable is always the same. A collection of different Waves that might or might not match their direct neighbours, so that a Wavetable scan through them might sound strange (but maybe that's what you want). However, they act as a good source for different static spectra when either UPPER WAVES is ON or SUB WAVES is set to OFFSET and WAVES SUB is set to a higher value that reaches into this Upper Wavetable. The new Wavetable Banks, however, sometimes have so-called Double Wavetables explained in the next chapter.

Using Double Wavetables and LFO Modulation

The new Wavetable banks by Wolfgang Palm (any but the ORIGINAL bank) have some Double Wavetables with the suffix "U". The PPG Wave 3.V has a second Wavetable memory for each Part. Normally, the Upper Wavetable is loaded into this memory, but the Double Wavetables

replace this memory with their own Waves offering a continuous range of 128 Waves.

When you activate UPPER WAVES and set WAVES OSC to 0, the Wavetable effectively starts at 64. When setting ENV 1 -> WAVES to 63, the maximum modulation now reaches Wavetable position 127. The sound "SynBrass U" from Wolfgang Palms Demo Soundbank shows this behaviour. This by itself is not meaningful, but it starts to become interesting when you apply an LFO modulation as well. The LFO can modulate over this whole range of Waves through both the Lower and the Upper Wavetable resulting in Wavetable scans with a resolution twice as high as on normal Wavetables.

List of the PPG Wave 3.V Wavetables

Bank: Original

No.	Wavetable	No.	Wavetable
000	Resonant	016	Formant1
001	Resonant2	017	Polated
002	MalletSyn	018	Transient
003	Sqr-Sweep	019	ElectricP
004	Bellish	020	Robotic
005	Pul-Sweep	021	StrongHrm
006	Saw-Sweep	022	PercOrgan
007	MellowSaw	023	ClipSweep
008	Feedback	024	ResoHarms
009	Add Harm	025	2 Echoes
010	Reso 3 HP	026	Formant 2
011	Wind Syn	027	FmntVocal
012	HighHarm	028	Sync
013	Clipper	029	PWM
014	Organ Syn	030	Upper Wavetable
015	SquareSaw	031	Piano/Sax

Bank: Synthesis

Wavetable	Wavetable	Wavetable
Saw2Tri	Harmon3	Struct3
SawLpR4	Harmon4	Struct4
SawLpR1	Harmon5	Struct5
Saw Lp	Inharm	Struct6
SineSweep	AnotherWT	Struct7
Harmon1	Struct1	
Harmon2	Struct2	

Bank: Analysis

Wavetable	Wavetable	Wavetable
Clavinet	ViolaEns U	EGit-TTR
ConcertGit	Cello U	Y-Synth
Celeste	BowedBass U	Percussion U
Marimba	PlckBass	HouseOrgan
Bell	GL Bass	B3Rock U
GrandP	SynBrass U	B3Jazz U
EPiano	Harp	B4Modulation U
Trombone	Sitar	

Bank: Mix

Wavetable	Wavetable	Wavetable
EPno2Inharm	EPno2Bell	Syn2LpR4
Inharm2Saw	Saw2Struct	Sitar2Bell
Harm2Saw	EPno2Struct	Sitar2You
Marimba2Saw	Saw2Inh2Struct	Tromb2Wave
Guitar2Harp	Sync2Harmon	Tromb2Sitar

Bank: Harmonic Split

Wavetable	Wavetable	Wavetable
Saw+WT	EPno+Perc U	Saw+Struct7
Saw+EPno	Perc+SyBras U	Ysyn+Struct7
Saw+Sitar	PBas+Perc U	EPno+Struct8
Saw+Piano	Saw+B3rock U	Inharm+Struct8
Saw+EgitTTR	Saw+Perc U	Sync+Struct8
Saw+Ysyn	Marimba+Perc U	Saw+Utt 'you'
Sync+AnothWT	B3jazz+Ysyn U	Saw+Utt 'wave'
Sync+GPiano	Saw+Struct1	Saw+Utt 'sind'
Saw+Perc U	Saw+Struct8	

Bank: Voice

Wavetable	Wavetable	Wavetable
SingleReso	4 Aa 72	7 Aa 60
3 Aa 55	4 Ih 72	7 Uw 60
3 Iy 55	4 Oh 72	Multi Aa
3 Uh 55	6 Aa 60	
3 Mh 55	6 Eh 60	

Bank: Utterance

Wavetable	Wavetable	Wavetable
1 'for the 20th'	2 'you' 70	3 'Sind In' 70
1 'will we' 60	3 'Um Uns '70	4 'Yeah' 69
1 'author of' 60	3 'Allzu' 70	5 'Rockiger' 68
1 'wave' 60	3 'Nur an' 70	6 'Feels like' 81

The Waveterm B Library

Since these are original disk images from the Waveterm B, their content isn't in the native PPG Wave 3.V format but the original PPG Wave 2.3 / Waveterm B format. Also, you won't find the individual files like Transients or Multi Transients on your hard disk, only the enclosing disks are there.

To import one or more of these Transients / Multi Transients proceed as follows:

- Switch to the BROWSER page and expand “Local Library” where you find the “PPG Waveterm B Sample Library” to see all installed Waveterm B disk images.
- As in the original PPG Wave the disks have some very cryptic naming. Expand any of the disk images (i.e. S85-01.WTB) to see which files are on it. These file types are recognized:
  - Mxxx - Multi Transients consists up to 8 Transients with the corresponding program data with keyboard splits.
  - Txxx –Transients consists of single samples with the corresponding program data.

- Multi Transients (Mxxx) can only be imported by a double-click. They consist of up to 8 samples with respective sounds. Keyboard splits or multi timbrality is recognized automatically and the parts are adjusted accordingly.

We recommend to use the Multi Transients because they load playable sound programs.

- Example: S85-01.WTB/M000 GRAND PIANO loads 8 samples and the respective sounds into the selected part program and up to the seventh following program, sets the keyboard ranges accordingly, all channels to 1, and transposes the sound as the PPG Wave 2.3 also did automatically depending on the octave the keyboard split started on.
- As soon as the plug-in detects that no keyboard splits are set (i.e. all on minimum or so), it loads the samples into the parts but sets the MIDI channels to different values.

One important thing to note: If you load a new multisample over an existing one, there might be leftovers from the previous multisample. I.e., if you had an 8 part multisample in memory and load a 4 part multisample, the other 4 parts still contain the old samples and key ranges / channel assignments and might sound when you play certain notes. At first, this might look like a bug but it isn't: when you make music with the PPG, you might add further samples to your existing multi, and not replace what you've did.

Transients (Txxx) can be imported in three ways:

- Double click imports it into the currently selected part program.
- Drag & drop to the program table imports it to that program (note: the Transient isn't loaded into RAM when this program isn't in one of the 8 part programs).
- Drag & drop to a part program to load it into that program.
- Drag & drop to the Transient column only loads the sample, not the sound parameters.

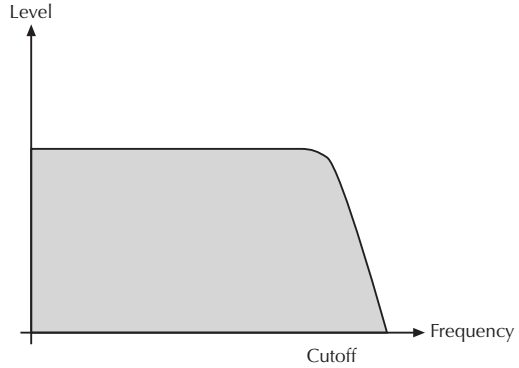
- ✻ Note: please re-read the last topic again, since this is a valuable feature: Dropping a Transient file onto the Transient column only loads the sample, not the associated sound parameters. This allows to set up a sound and experiment with different samples for this sound.
- ✻ If you want to use your own Waveterm disk images in the PPG Wave 3.V, just drag those files into the File Browser to the location you like. Please note that the files are moved to your sound library physically, if you want to copy them, press the [Alt] key during drag & drop.

Filter Introduction

Once the audio signal leaves the basic sound synthesis, it is sent to the filter. The filter is a component that have significant influence on the PPG Wave 3.V's sound characteristics.

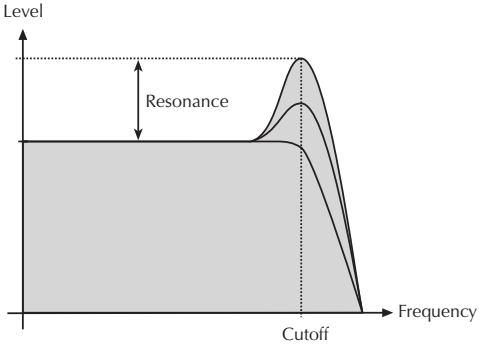
For now, we'll explain the basic function of a filter discussing the type used most commonly in synthesizers as also in our PPG Wave 3.V: the low pass filter.

The low pass filter type dampens frequencies that lie above a specified cutoff frequency. Frequencies below this threshold are hardly affected. The frequency below the cutoff point is called the pass band range, the frequencies above are called the stop band range. The PPG Wave 3.V's filter dampens frequencies in the stop band with a certain slope. The slope can be 12dB or 24dB per octave. This means that the level of a frequency that lies an octave above the cutoff point will be 12dB or 24dB less than those frequencies of the signal that fall into the pass band. The following picture shows the basic principle of a low pass filter:



To give you an idea of the extent of damping, consider this example of a low pass filter: A reduction of 24dB reduces the original level one octave above the cutoff point by approx. 94%. The damping factor two octaves above the cutoff point reduces the original level by more than 99%, which in most cases means this portion of the signal is no longer audible.

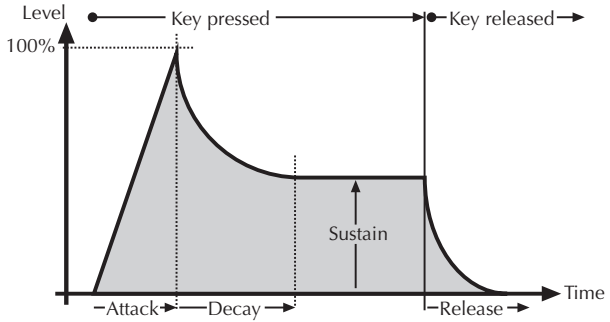
The PPG Wave 3.V's filter also features an emphasis parameter (also known as resonance parameter). Emphasis in the context of a low pass filter means that a narrow frequency band around the cutoff point is emphasized. The following picture shows the effect of the resonance parameter on the filter's frequency curve:



If emphasis is raised to a great extent, then the filter will begin self-oscillation, i.e. the filter generates an audible sine wave even when it does not receive an incoming signal.

The Envelope

Most traditional synthesizers feature ADSR envelopes. These envelopes are made up of four parameters that determine their response: **Attack, Decay, Sustain** and **Release.** The other parameters of the Envelope section have no function, so they can not be edited. The following picture illustrates the structure of an ADSR envelope:



ADSR Envelope

The envelope is started by pressing a key. It ascends to its maximum value at the rate determined by the **Attack** parameter. It then descends at the rate determined by the **Decay** value until it reaches the predetermined **Sustain** value. It remains at this value until the key is released. The envelope then descends to zero at the rate determined by the **Release** parameter.

Controller Numbers

Controllers marked with * don't change the Sound program but can perform temporary modulations or other tasks.

Ctrl #	Controller Range	Controller Name/ Sound Parameter	Value Range
0	*not used*	*undefined*	*not used*
1	0…127	Modulation Wheel	0…127
2	*not used*	*undefined*	*not used*
3	*not used*	*undefined*	*not used*
4	*not used*	Foot Control*	*not used*
5	*not used*	Glide Time	*not used*
6	*not used*	Data Entry	*not used*
7	0…127	MIDI Volume	0…127
8	0…127	BASIS	0...63
9	0...127	PPG WAVE MODE	*2.2, 2.3, 2.V*
10	0…127	MIDI Panning	L64…R63
11	*not used*	Expression	*not used*
12	0…127	LFO DELAY	0...63

13	0...127	LFO WAVESHAPE	triangle, saw up, saw down, square
14	0...127	LFO RATE	0..63 oder 128 Bars..1/32
15	0...127	ENV3 ATTACK	0...63
16	0...127	ENV3 DECAY	0...63
17	0...127	ENV3 ATT	0...63
18	0...127	ENV1 ATTACK	0...63
19	0...127	ENV1 DECAY	0...63
20	0...127	ENV1 SUSTAIN	0...63
21	0...127	ENV1 RELEASE	0...63
22	0...127	ENV2 ATTACK	0...63
23	0...127	ENV2 DECAY	0...63
24	0...127	ENV2 SUSTAIN	0...63
25	0...127	ENV2 RELEASE	0...63
26	0...127	WAVES-OSC	0...63
27	0...127	WAVES-SUB	0...63
28	0...127	ENV1>VCF	0...63
29	0...127	ENV2>VCA	0...63
30	0...127	ENV1>WAVES	0...63
31	0...127	LFO SYNC	OFF, ON
32	*0...127*	*undefined*	*not used*
33	0...127	TRUE PPG	OFF, ON
34	0...127	WAVETABLE BANK	0...6
35	0...127	WAVETABLE	Depends on WT BANK
36	0...127	UPPER WAVES	OFF, ON
37	0...127	SUB-WAVES	OFF, OFFSET, DIRECT, ENV 3
38	0...127	KEYB MODE	POLY, DUAL, QUAD, MONO
39	0...127	ARP ACTIVE	OFF, ON
40	0...127	ARP MODE	UP, DOWN, ALT, RND, MOVIN
41	0...127	ARP RATE	1/32...2/1
42	0...127	ARP RANGE	1, 2, 3, 4 OCTAVE
43	0...127	DETUNE	0.00 CENT...2 OCT
44	0...127	MOD>OSC	OFF, ON / Fine Mode: -100%... +100%
45	0...127	MOD>SUB	OFF, ON / Fine Mode: -100%... +100%
46	0...127	ENV3>OSC	OFF, ON
47	0...127	ENV3>SUB	OFF, ON
48	0...127	SEMITONE 1	0...63
49	0...127	SEMITONE 2	0...63
50	0...127	SEMITONE 3	0...63

51	0…127	SEMITONE 4	0...63
52	0…127	SEMITONE 5	0...63
53	0…127	SEMITONE 6	0...63
54	0…127	SEMITONE 7	0...63
55	0…127	SEMITONE 8	0...63
56	0…127	KEY>WAVES	0%...175%
57	0…127	KEY>FILTER	0%...233%
58	0…127	KEY>LOUDNESS	10: 1, 10: 2, 10: 5, 10:10, 7:10, 4:10, 1:10
59	0…127	VEL>FILTER	OFF, ON / Fine Mode: -100%... +100%
60	0…127	VEL>LOUDNESS	OFF, ON / Fine Mode: -100%... +100%
61	0…127	MOD>WAVES	OFF, ON / Fine Mode: -100%... +100%
62	0...127	MOD>FILTER	OFF, ON / Fine Mode: -100%... +100%
63	0...127	LFO>LOUDNESS	OFF, ON / Fine Mode: -100%... +100%
64	0…127	SUSTAIN PEDAL	OFF, ON
65	*not used*	*undefined*	*not used*
66	*not used*	*undefined*	*not used*
67	*not used*	*undefined*	*not used*
68	*not used*	*undefined*	*not used*
69	*not used*	*undefined*	*not used*
70	0…127	TOUCH>WAVES	OFF, ON / Fine Mode: -100%... +100%
71	0…127	EMPHASIS	0…63
72	0…127	TOUCH>FILTER	OFF, ON / Fine Mode: -100%... +100%
73	0…127	TOUCH>LOUDNESS	OFF, ON / Fine Mode: -100%... +100%
74	0…127	CUTOFF	0...63
75	0…127	TOUCH>MOD	OFF, ON
76	0…127	FINE MOD	OFF, ON
77	0…127	BEND>FILTER	0%...100%
78	0…127	BEND>WAVES	0%...100%
79	0…10	DRIVE TYPE	OFF, ON
80	0…127	DRIVE	0...63
81	0…127	SLOPE	OFF, ON
82	0…127	BEND>OSC	0...12
83	0…127	BEND>SUB	0...12
84	0…127	BEND>LOUDNESS	OFF, ON / Fine Mode: -100%... +100%
85	0…127	VEL>WAVES	OFF, ON / Fine Mode: -100%... +100%

86	0…127	MOD>LOUDNESS	OFF, ON / Fine Mode: -100%... +100%
87	0…127	LFO>OSC	OFF, ON / Fine Mode: -100%... +100%
88	0…127	LFO>SUB	OFF, ON / Fine Mode: -100%... +100%
89	0…127	FLO>WAVES	OFF, ON / Fine Mode: -100%... +100%
90	0…127	LFO>FILTER	OFF, ON / Fine Mode: -100%... +100%
91	0…127	Wheel>WAVES	OFF, ON / Fine Mode: -100%... +100%
92	0…127	Wheel>FILTER	OFF, ON / Fine: -100%... +100%
93	*not used*	*undefined*	*not used*
94	0…127	PHASER Mix	0.0%...100.0%
95	0…127	CHORUS Mix	0.0%...100.0%
96	0…127	DELAY Mix	0.0%...100.0%
97	0…127	REVERB MIX	0.0%...100.0%
98	*not used*	*undefined*	*not used*
99	*not used*	*undefined*	*not used*
100	*not used*	*undefined*	*not used*
101	*not used*	*undefined*	*not used*
102	0…127	EQ ACTIVE	OFF, ON
103	0…127	EQ LOW FREQ	10 Hz...1000.0Hz
104	0…127	EQ LOW GAIN	-20.0dB...+20.0dB
105	0…127	EQ MID 1 FREQ	20 Hz...20000Hz
106	0…127	EQ MID 1 GAIN	-20.0dB...+20.0dB
107	0…127	EQ MID 2 FREQ	20 Hz...20000Hz
108	0…127	EQ MID 2 GAIN	-20.0dB...+20.0dB
109	0…127	EQ HIGH FREQ	200 Hz...20000Hz
110	0…127	EQ HIGH GAIN	-20.0dB...+20.0dB
111	0…127	OVERDRIVE DRIVE	0%...100.0%
112	0…127	PHASER Mod Speed	0 Hz...20.00Hz
113	0…127	PHASER Mod Depth	0.000%...100.0%
114	0…127	PHASER Frequency	11.56Hz...18794.54Hz
115	0…127	CHORUS Mod Speed	0 Hz...20.00Hz
116	0…127	CHORUS Mod Depth	0.000%...100.0%
117	0…127	DELAY Time	0.02...2000.00ms
118	0…127	DELAY Feedback	-100.0%...+100.0%
119	0...127	REVERB Decay	0.0%...100.0%

120	0	All Sound Off*	immediate silence
121	0	Reset All Controllers*	resets all controllers
122	*not used*	*undefined*	*not used*
123	0	All Notes Off*	releases all voices
124	*not used*	Omni Mode Off	*not used*
125	*not used*	Omni Mode On	*not used*
126	*not used*	Poly Mode On/Off	*not used*
127	*not used*	Poly Mode On	*not used*

Glossary

Aftertouch

The majority of contemporary keyboards are capable of generating aftertouch messages. On this type of keyboard, when you press harder on a key you are already holding down, a MIDI Aftertouch message is generated. This feature makes sounds even more expressive (e.g. through vibrato).

Aliasing

Aliasing is an audible side effect arising in digital systems as soon as a signal contains harmonics higher than half the sampling frequency.

Amount

Describes to which extent a modulation influences a given parameter.

Amplifier

An amplifier is a component that influences the volume level of a sound via a control signal. This control signal is often generated by an envelope or an LFO.

Arpeggiator

An arpeggiator is a device that splits an incoming chord into its single notes and repeats them rhythmically. Most arpeggiators feature different sequence modes to cover a wide range of applications. Typical controls for an arpeggiator are the octave range, the direction, the speed and the clock, which means the repetition interval. Some arpeggiators also feature preset or programmable rhythm patterns.

Attack

An envelope parameter. “Attack” is a term that describes the ascent rate of an envelope from its starting point to the point where it reaches its highest value. The Attack phase is initiated immediately after a trigger signal is received, i.e. after you play a note on the keyboard.

Clipping

Clipping is a sort of distortion that occurs when a signal exceeds its maximum value. The curve of a clipped signal is dependent of the system where the clipping takes place. In the analog domain, clipping effectively limits the signal to its maximum level. In the digital domain, clipping is similar to a numerical overflow and so the polarity of the signal’s part above the maximum level is negated.

Control Change (Controllers)

MIDI messages enable you to manipulate the response of a sound generator to a significant degree.

This message essentially consists of two components:

• The Controller number, which defines the element to be influenced. It can be between 0 and 120.

• The Controller value, which determines the extent of the modification.

Controllers can be used for effects such as slowly swelling vibrato, changing the stereo panorama position and influencing filter frequency.

Decay

“Decay” describes the descent rate of an envelope once the Attack phase has reached its zenith and the envelope drops to the level defined for the Sustain value.

Emphasis

Emphasis or resonance is an important filter parameter. It emphasizes a narrow bandwidth around the filter cutoff frequency by amplifing these frequencies. This is one of the most popular methods of manipulating sounds. If you substantially increase the emphasis, i.e, to a level where the filter begins self-oscillation, then it will generate a relatively clean sine waveform.

Envelope

An envelope is used to modulate a sound-shaping component within a given time frame so that the sound is changed in some manner. For instance, an envelope that modulates the cutoff frequency of a filter opens and closes this filter so that some of the signal's frequencies are filtered out. An envelope is started via a trigger, usually a fixed trigger. Normally, the trigger is a MIDI Note. The classic envelope consists of four individually variable phases: Attack, Decay, Sustain and Release. This sequence is called an ADSR envelope. Attack, Decay and Release are time or slope values, and Sustain is a variable volume level. Once an incoming trigger is received, the envelope runs through the Attack and Decay phases until it reaches the programed Sustain level. This level remains constant until the trigger is terminated. The envelope then initiates the Release phase until it reaches the minimum value.

Filter

A filter is a component that allows some of a signal's frequencies to pass through it and dampens other frequencies. The most important aspect of a filter is the filter cutoff frequency. Filters generally come in four categories: low pass, high pass, band pass, and band stop. A low pass filter dampens all frequencies above the cutoff

frequency. A high pass filter in turn dampens the frequencies below the cutoff. The band pass filter allows only those frequencies around the cutoff frequency to pass, all others are dampened. A band stop filter does just the opposite, i.e. it dampens only the frequencies around the cutoff frequency. The most common type is the low pass filter.

Filter Cutoff Frequency

The filter cutoff frequency is a significant factor for filters. A low pass filter dampens the portion of the signal that lies above this frequency. Frequencies below this value are allowed to pass through without being processed.

LFO

LFO is an acronym for low-frequency oscillator. The LFO generates a periodic oscillation at a low frequency and features variable waveshapes. Similar to an envelope, an LFO can be used to modulate a sound-shaping component.

Low Pass Filter

Synthesizers are often equipped with a low pass filter. A low pass filter dampens all frequencies above its cutoff frequency. Frequencies below the cutoff point are not affected.

Manual

Manuals for Waldorf products are written during night-shifts by solituded people which fear the daylight. Please appreciate this by using this manual here and there. We recommend to deposit it in your restroom within reach.

MIDI

The acronym MIDI stands for “musical instrument digital interface.” It was developed in the early '80s so that diverse types of electronic musical instruments by different manufacturers could interact. At the time a communications standard for heterogeneous devices did not exist, so MIDI was a significant advance. It made it possible to link all devices with one another through simple, uniform connections.

Essentially, this is how MIDI works: One sender is connected to one or several receivers. For instance, if you want to use a computer to play the Pulse, then the computer is the sender and the Pulse acts as the receiver. With a few exceptions, the majority of MIDI devices are equipped with two or three ports for this purpose: MIDI In, MIDI Out and in some cases MIDI Thru. The sender transfers data to the receiver via the MIDI Out jack. Data are sent via a cable to the receiver's MIDI In jack.

MIDI Thru has a special function. It allows the sender to transmit to several receivers. It routes the incoming signal to the next device without modifying it. Another device is simply connected to this jack, thus creating a chain through which the sender can address a number of receivers. Of course it is desirable for the sender to be able to address each device individually. Consequently, there is a rule which is applied to ensure each device responds accordingly.

MIDI Channel

This is a very important element of most messages. A receiver can only respond to incoming messages if its receive channel is set to the same channel as the one the sender is using to transmit data. Subsequently, the sender can address specific receivers individually. MIDI Channels 1 through 16 are available for this purpose.

MIDI Clock

The MIDI Clock message determines the tempo of a piece of music. It serves to synchronize processes based on time.

Modulation

A modulation influences or changes a sound-shaping component via a modulation source. Modulation sources include envelopes, LFOs or MIDI messages. The modulation destination is sound-shaping component such as a filter or a VCA.

Note on / Note off

This is the most important MIDI message. It determines the pitch and velocity of every generated note. The time of arrival is simultaneously the start time of the note. Its pitch is derived from the note number, which lies between 0 and 127. The velocity lies between 1 and 127. A value of 0 for velocity is similar to “Note Off”.

Panning

The process of changing the signal's position within the stereo panorama.

Pitchbend

Pitchbend is a MIDI message. Although pitchbend messages are similar in function to control change messages, they are a distinct type of message. The reason for this distinction is that the resolution of a pitchbend message is substantially higher than that of a conventional Controller message. The human ear is exceptionally sensitive to deviations in pitch, so the higher resolution is used because it relays pitchbend information more accurately.

Program Change

These are MIDI messages that switch sound programs. Program numbers 1 through 128 can be changed via program change messages.

Release

An envelope parameter. The term “Release” describes the descent rate of an envelope to its minimum value after a trigger is terminated. The Release phase begins immediately after the trigger is terminated, regardless of the envelope's current status. For instance, the Release phase may be initiated during the Attack phase.

Sustain

The term “Sustain” describes the level of an envelope that remains constant after it has run through the Attack and Decay phases. Sustain lasts until the trigger is terminated.

Trigger

A trigger is a signal that activates events. Trigger signals are very diverse. For instance, a MIDI note or an audio signal can be used as a trigger. The events a trigger can initiate are also very diverse. A common application for a trigger is its use to start an envelope.

Volume

The term describes a sound's output level.

Wave

Here: A Wave is a digitally memorized reproduction of one single period of a periodic waveform, such as a sawtooth wave. Insofar it is identical with a Sample that is looped after one single wave pass. In contrast to the samples in a sampler, all Waves in the Waldorf Wave-table Synthesizers have the same lengths and are played back at the same pitch.

Wavetable

One oscillator shape in the PPG Wave 3.V bases on waveform sets, called Wavetables. Wavetables are a collection of up to 128 Waves. The playback sequence of the Waves can be dynamically altered, which results in interesting sound transformations. If the Waves in the Wavetable are similar in shape, the result will sound smooth and pleasant. If, however, the shapes are completely different, the result will have wild spectral changes and may sound harsh.

Product Support

If you have any questions about your Waldorf product, feel free to contact us via one of the four options listed below:

1. Send us an email message. This is the most efficient and fastest way to contact us. Your questions will be forwarded immediately to the resident expert and you will quickly receive an answer.

support@waldorfmusic.de

2. Send us a letter. It will take a bit longer, but it is just as dependable as an email.

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